

An aerial, top-down view of a white Airbus A320neo aircraft on a dark asphalt runway. The aircraft is centered in the lower half of the frame, facing the viewer. The runway has white dashed lines and markings, including the letters 'M' and 'N' in the distance. The sky is not visible, focusing attention on the aircraft and the runway.

Digest of available  
enhancements

# A320 Family

Version 11

**AIRBUS**



Dear customers,

The objective of this leaflet is to present an updated overview of available operational/safety enhancements for which your fleet might be eligible.

This extract focuses on selected design evolutions which are part of the “Safety Beyond Standard” Airbus initiative, which aims at further enhancing the safety of the fleet beyond requirements.

Additional objective is to reduce the number of OEBs that are still applied on some aircraft despite the availability of fixes to close such OEBs.

This list does not claim to be exhaustive nor does it include items already covered by mandatory actions.

For a detailed description and guidelines on any of the items included in this leaflet, you must refer to the latest revision of the Airbus documentation.

Should you have any specific questions, please do not hesitate to contact Airbus either through your Field Representative or your Customer Support Director.

We hope that, while each operator has the responsibility to adapt its operations to local airworthiness rules and to define training and procedures in line with its own operational conditions, this leaflet will be beneficial to your operations.

Best Regards,

Yannick Malinge  
SVP – Head of Aviation Safety

A handwritten signature in black ink, appearing to read 'Y Malinge', with a horizontal line extending to the right.

## Safety Beyond Standard

Airbus launched the Safety Beyond Standard initiative to further enhance the safety of the fleet beyond requirements.

One of the primary objectives is to enhance the A320 and A330 family aircraft so that they are similar to the A350 in terms of operational capability, resilience, and assistance to the flight crew in abnormal conditions.

The Safety Beyond Standard initiative aims to reduce exposure to identified safety threats, starting with Loss of Control In-flight (LOC-I), Controlled Flight Into Terrain (CFIT), Runway Excursion (RE), fire, smoke, cabin depressurization, abnormal ground control, and abnormal fuel situations. Safety Beyond Standard is a continuous improvement initiative, therefore, additional enhancements will be proposed in the next issues of this digest.

To reduce the threat of LOC-I for example, design enhancements are developed to achieve these three high-level objectives:

- Enhance autopilot availability;
- Enhance flight envelope protection availability;
- Enhance flight crew interface and awareness.

On the following pages, you will find several available enhancements that are part of the Safety Beyond Standard initiative. They are identified with the tag shown below.



**Safety Beyond Standard**

A summary table of these enhancements is also available on the next page.

For more information on the Safety Beyond Standard enhancements, please also refer to the ISI 22.00.00104.

Several safety enhancements of the Safety Beyond Standard initiative are subject to an Airbus monitored retrofit campaign (refer to each individual enhancement for Retrofit Information Letter references).

### > Contact

For more information on the Safety Beyond Standard initiative, please contact your Field Representative or your Customer Support Director.

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## Modification of label for precautions during ground air pre-conditioning

### UPDATED

Safety Beyond Standard

#### Ground personnel injury prevention Aircraft damage prevention

ATA 21

A320 family A/C

No OEB

#### > Description of safety topic

During operation of ground air supply, with the Outflow Valve closed and with a fully closed cabin, there is risk of aircraft damage and injury to personnel in the event of an undetected build-up of cabin pressure.

#### > Available enhancements

Introduction of new labels to give additional recommendations to minimize the possibility of cabin residual pressure during ground air supply.

This improves awareness to reduce risk of aircraft damage and/or injury to persons during operation of the ground air supply.

This is embodied by the following SB:

- **SB A320-11-1097**: Modify warning marking for LP/HP ground connection.

## Introduction of new OFV, CPC and Flight Deck Monitoring

### UPDATED

Safety Beyond Standard

#### Cabin depressurization prevention/IFTB Diversion/Emergency descent prevention

ATA 21

A320 family A/C

No OEB

#### > Description of safety topic

Loss of pressurization events can occur due to incorrect control of the cabin pressure caused by erroneous sensed pressure values (too high or too low) with or without alarm displayed to flight crew.

#### > Available enhancements

The available enhancements consist of two enhancements that can be embodied separately:

1. Improvement to Cabin Pressurization and Control: New Outflow Valve (OFV) and Cabin Pressure Controller (CPC) introducing additional pressure sensors and detection robustness against erroneous cabin pressure measurement:
  - **SB A320-21-1203**: Introduction of new OFV P/N 20790-20BA;
  - **SB A320-21-1204**: Introduction of new CPC P/N 20791-13AD.

The activation of the system robustness requires the concurrent embodiment of both SB. An upgrade (as per IPC) to the newest CPC (evo S4 P/N 24441-01AB) is preferred as it brings additional robustness against internal CPC potential malfunction.

2. Additional Flight Deck Indication: Display of ECAM memo "OXY PAX ON" to the flight crew as additional indication that masks are deployed:
  - **SB A320-35-1067**: Adaptation pass info relay, relay socket and wirings for Gaseous Oxygen System (GOS);
  - **SB A320-35-1068**: Adaptation pass info relay, relay socket and wirings for chemical oxygen system.

#### > Aircraft prerequisites

The ECAM memo introduction requires at least the following FWC standard or subsequent (subject to monitored retrofit and airworthiness directive):

- **SB A320-31-1373**: Introduction of FWC standard H2-F6.

#### > Additional benefits

For aircraft fitted with older CPC, the replacement with a newer P/N (including 20791-13AD or 24441-01AB) will bring an additional benefit replacing the removable pressure sensor protection by fixed ones, preventing risk of erroneous pressure measurement in case the protections are left in place after maintenance.

#### > Other references

- ISI 21.30.00010 Cabin Pressure Control System Main Enhancements

## Introduction of new skin air valves logics and monitoring

Safety Beyond Standard

### UPDATED

#### Cabin depressurization prevention/IFTB Diversion/Emergency descent prevention

ATA 21

A320 family A/C

No OEB

#### > Description of safety topic

Several operators reported ECAM Warning (E/W) "VENT SKIN VALVE FAULT" associated with "SKIN AIR INLET V 15HQ" or "SKIN AIR OUTLET V 22HQ" fault message, sometimes associated with "VENT AVNCS SYS FAULT" E/W leading to Operational Interruption (O).

This phenomenon mainly occurs during valve operation, at Take-Off phase or after Take-Off phase.

#### > Available enhancements

To prevent In Flight Turn Back, Diversion or Rejected Take-Off in case of valve failure at Take-Off, the enhancement modifies Avionics Equipment Ventilation System (AEVS) logics to use the TO CONFIG P/B input in addition to the Throttle Lever Angle (used currently) to command the closure of the valve earlier and notify the flight crew about valve malfunction before the Take-Off roll is engaged.

Wiring adaptation and SDAC pin programming modification:

- **SB A320-21-1264** (NEO);
- **SB A320-21-1263** (CEO);
- RIL SA21M23000355 (for **SB A320-21-1263** and **A320-21-1264**).

#### > Aircraft prerequisites

FWC H2-F13 will be a prerequisite for both hardware modifications.

- **SB A320-31-1609** (NEO);
- **SB A320-31-1608** (CEO);
- RIL SA31M21004114 (for **SB A320-31-1608** and **A320-31-1609**).

#### > Other references

- TFU 21.26.00073 A320FAM – Skin Air Valves Failure NFF and Population 3 Failure

#### > Contacts

For more information on the monitored retrofit campaign please contact Retrofit Operations at the following email address [monitored.retrofit@airbus.com](mailto:monitored.retrofit@airbus.com)

## Introduction of new Avionics Equipment Ventilation Computer (PN-07)

Safety Beyond Standard

#### Spurious avionics smoke warning prevention Reduction of IFTB

ATA 21

A320 family A/C

No OEB

#### > Description of safety topic

Cases of Avionics Smoke have been reported, further to failures of electrical components within the AEVC (Avionics Equipment Ventilation Computer).

#### > Available enhancements

Improved components and software logic within the AEVC to prevent Avionics Smoke have been introduced with AEVC standard-06:

- **SB A320-21-1147**: Avionics equipment ventilation – Install THALES AEVC std 06 p/n 87292325v06.

Further improvements of the AEVC software have been introduced with AEVC Std-07 to improve resilience to repetitive "VENT AVNCS SYS FAULT" ECAM warning:

- **SB A320-21-1217**: Avionics equipment ventilation – Introduce new standard of AEVC (PN -V07).

Further improvements have been introduced with AEVC Std-07 associated to an additional comfort duct temperature sensor to minimize the likelihood of condensation in avionics ventilation ducts:

- **SB A320-21-1216**: Avionics equipment ventilation – Introduce avionics comfort duct temperature sensor.

#### > Other references

- TFU 21.26.00.019 – AEVC Overcurrent Protection Failures
- TFU 21.26.34.003 – VENT ANVCS SYS FAULT ECAM Warning – AEVC V06 & System improvements

## Introduction of Ball Bearing Health Monitoring on avionics fan

Safety Beyond Standard

### Smoke prevention

ATA 21

A320 family A/C

No OEB

#### > Description of safety topic

Cases of smoke in cockpit have been reported further to failures of avionics fan.

#### > Available enhancements

The Ball Bearing Health Monitoring (BBHM) option has been developed in order to monitor the fan vibration frequencies and determine first signs of ball bearing failure, which will reduce the likelihood of smoke events in the cockpit.

- This monitoring can be embodied as per: **VSB 3454HC-21-101** BBHM option (MOD 160921).
- In addition, a new avionics fan has been developed based on A380 & A350 fan concept and is fully interchangeable with previous standard. The objective of the new fan design is to reach a GMTBUR around 40 000FH. Introduction as per IPC of new avionics fan PN AE181900B00 (MOD 163598).

#### > Other references

- TFU 21.26.00.030 Avionics fan EVT3454HC premature failure
- TFU 21.26.00.033 Avionics fan PN AE1819B00 – BBHM

## Introduction of speed protection package and FD disengagement to prevent potential speed overshoot or undershoot

### Speed overshoot/undershoot prevention

ATA 22

A319/A320/A321 A/C

No OEB

#### > Description of safety topic

Speed overshoot or undershoot may occur when Automatic Flight System (AFS) experiences a perturbation (wind gradient, engine failure...).

#### > Available enhancements

Activation of the Speed protection package (AP/FD speed protection, AP/FD engagement / disengagement conditions) is performed via pin programming (Mod. 25879, 26497):

- **SB A320-22-1072.**

#### > Aircraft prerequisites

This function requires at least the FMGC FMS 2 (mandated by EASA AD 2016-0122 & FAA AD 2017-20-10) and FCU standard M11.



## Introduction of FG standard PC20/PI18

UPDATED

Safety Beyond  
Standard

### High pitch protection during Go Around New safety functions capability

ATA 22

A320 family A/C fitted with FG 3G

Cancel OEB 57

#### > Description of safety topic

FG standards PC20 & PI18 introduce several enhancements, some of them being part of Safety Beyond Standard (see ISI 22.00.00104):

- Enhance autopilot robustness in case of FMS failure and in case of LGCIU failure;
- Avoid excessive pitch during Go Around with AP engaged on A320 NEO family aircraft and A319 CEO;
- Avoid FMGC reset during flare in crosswind conditions on A321 NEO CFM;
- TCAS Alert Prevention function (TCAP), which allows to avoid unnecessary TCAS resolution advisories when capturing flight level;
- FMGC hardware pin-prog display on MCDU;
- A/THR auto-engagement in overspeed situation to automatically reduce the airspeed;
- Protection against secondary glide slope capture.

#### > Available enhancements

The following SBs are subject to Airbus monitored retrofit campaign:

- S8API18 HW4: NEO **A320-22-1827**; CEO **A320-22-1826** (RIL SA22M21003922)
- S8APC20 HW4: NEO **A320-22-1828**; CEO **A320-22-1829** (RIL SA22M21003923)
- S8API18 HW1: NEO **A320-22-1824** (RIL SA22M21003904); CEO **A320-22-1825** (RIL SA22FM2200445)
- S8APC20 HW1: NEO **A320-22-1822** (RIL SA22M21002334); CEO **A320-22-1823** (RIL SA22FM2200391)
- H4PI18: NEO **A320-22-1819** (RIL SA22M21001923); CEO **A320-22-1818** (RIL SA22M21003964)
- H4PC20: NEO **A320-22-1821** (RIL SA22M21003901); CEO **A320-22-1820** (RIL SA22D21022406)
- H2CPC20: CEO **A320-22-1895** (standard compatible with EIS1) (RIL SA22M23000996)
- H2CPI18: CEO **A320-22-1896** (standard Compatible with EIS1) (RIL SA22M23001404)

#### > Other references

- ISI 22.83.00003

#### > Contacts

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## Introduction of FG standard C15/I16

NEW

Safety Beyond  
Standard

### High pitch protection during Go Around New safety functions capability

ATA 22

A320 family A/C fitted with FG 2G

Cancel OEB 57

#### > Description of safety topic

FG standards C15 / I16 introduce several enhancements, some of them being part of Safety Beyond Standard (see ISI 22.00.00104):

- Enhance autopilot robustness in case of FMS failure;
- Enhance autopilot robustness in case of LGCIU failure;
- Avoid excessive pitch during Go Around with AP engaged on A320 NEO family aircraft and A319 CEO;
- Avoid FMGC reset during flare in crosswind conditions on A321 NEO CFM;
- Introduction of FMGC hardware pin-prog display on MCDU;
- Protection against secondary glide slope capture.

#### > Available enhancements

The following SBs are subject to Airbus monitored retrofit campaign:

- S7BC15 CEO **A320-22-1B20** (Dispatch Q2 2024);
- H2CC15 CEO **A320-22-1897** (Dispatch Q2 2024);
- H2CI16 CEO **A320-22-1B15** (Dispatch Q3 2024);
- FG I16 will be associated to Thales FMS S9 (Dispatch 2025).

#### > Other references

- ISI 22.83.00003

## Introduction of FMS2 Release 1A Standard H2C (Honeywell)

Safety Beyond Standard

### Take off securing Baro radio setting

ATA 22

A320 family A/C fitted with FG 2G

Cancel OEB  
14, 17, 31, 41, 46

#### > Description of safety topic

The following safety enhancements have been developed and introduced in FMS2 Release 1A standard H2:

- Take Off Securing function (TOS1):
  - To alert flight crew of incorrect take-off parameters;
- Baro radio setting:
  - MDA/MDH field replaced by BARO on MCDU PERF APPR page,
  - DH field replaced by RADIO;
- No profile invalidation at MDA -50ft:
  - Allows to remain with AP engaged in case of missed approach below minimum.

#### > Available enhancements

Honeywell FMS2 Release 1A standard H2C can be embodied via:

- **SB A320-22-1547** [FMGC 2G H2C15 – CEO IAE/PW];
- **SB A320-22-1523** [FMGC 2G H2CC14 – CEO CFM], RIL SA22M16000532.

#### > Additional benefits

OEB 14, 17, 31, 41 and 46 are cancelled by FMS2 release 1A standard H2.

#### > Other references

- TFU 22.70.00.048
- OIT 999.0107/09
- ISI 22.83.00003

#### > Contacts

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## Introduction of FMS2 Release 1A Standard S7B (Thales)

### Incorrect FAC weight due to dashed CG on FUEL PRED page Erroneous auto-tuning of the MLS

ATA 22

A320 family A/C fitted with Thales  
FMS2 standard S7A or below

Cancel OEB  
54, 49

#### > Description of safety topic

The following safety enhancement has been developed and introduced in FMS2 Release 1A standard S7B:

- Correction of erroneous vertical profile in final approach covered by Flight Operations Transmissions (FOT) 999.0064/16;
- Correction of erroneous FLS deviation in QFE baro reference covered by AFM TR757 and LIM-AFS-10-00021676. Only for aircraft equipped with QFE capability (MOD 20406) and FLS option (MOD 35811);
- Correction of default Center of Gravity (CG) value at engine start linked to red OEB 54, FOT 999.0034/17 and FOT 999.0130/16;
- Correction of Wrong Microwave Landing System (MLS) / GBAS Landing System (GLS) auto-tuning linked to white Operations Engineering Bulletin (OEB) No. 49 and FOT 999.0077/15.

#### > Available enhancements

New Thales FMS2 Release 1A standard S7B can be embodied via:

- FMGC 3G:
  - S7B PC18: **A320-22-1604** (CEO),
  - S7B PI16: **A320-22-1308** (CEO);
- FMGC 2G:
  - S7BC14: **SB A320-22-1590**,
  - S7BI15: **SB A320-22-1591** and **A320-22-1617**.

#### > Aircraft prerequisites

Installation of standard S7B requires the previous installation Thales FMS2 Rev. 2+ standard S5 or FMS2 Release 1A standard S7A or below.

#### > Additional benefits

Installation of standard S7A enables the additional safety enhancements introduced with S6 which include:

- Take off securing function step 1 (TOS1);
- Baro radio setting;
- No profile invalidation at MDA -50ft.

## Introduction of FMS2 Release 2 standard H3 (Honeywell)

Safety Beyond Standard

### UPDATED

High pitch protection during Go Around  
New safety functions capability  
Take off securing

ATA 22

A320 family A/C fitted with EIS2 and FG 2G

No OEB

#### > Description of safety topic

For aircraft fitted with FG 2G, FMS H3 provides the following safety enhancements:

- Take-Off Surveillance 1 (TOS1) improvements;
- Take-Off Surveillance 2 (TOS2) improvements;
- FMS Landing System (FLS) and FINAL APP coexistence capability;
- Cancellation of temporary abnormal behavior "Erroneous lateral guidance in NAV mode with LOC mode armed during approach".

#### > Available enhancements

Honeywell FMS2 standard H3 can be embodied via:

- **SB A320-22-1716** [FG 2G H3C14] covering CFM NEO;
- **SB A320-22-1715** [FG 2G H3I15] covering IAE NEO.

#### > Other references

- ISI 22.83.00003

## Introduction of FMS2 Release 2 standard H4 (Honeywell)

Safety Beyond Standard

### UPDATED

High pitch protection during Go Around  
New safety functions capability  
Take off securing

ATA 22

A320 family A/C fitted with EIS2 and FMGC 3G

Cancel OEB 57

#### > Description of safety topic

For aircraft fitted with FG 3G, FMS H4 provides the following safety enhancements:

- Take-Off Surveillance 1 (TOS1) improvements;
- Take-Off Surveillance 2 (TOS2) improvements;
- FMS Landing System (FLS) and FINAL APP coexistence capability;
- Satellite Landing System (SLS) CAT1 approach capability;
- Cancellation of temporary abnormal behavior "Erroneous lateral guidance in NAV mode with LOC mode armed during approach".

#### > Available enhancements

Honeywell FMS2 standard H4 can be embodied via:

- **SB A320-22-1821** [FG 3G H4PC20], RIL SA22M21003901 and **A320-22-1819** [FG 3G H4PI18], RIL SA22M21001923 covering NEO;
- **SB A320-22-1820** [FG 3G H4PC20], RIL SA22D21022406 and **A320-22-1818** [FG 3G H4PI18], RIL SA22M21003964 covering CEO.

#### > Other references

- ISI 22.83.00003

#### > Contacts

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## Introduction of FMS2 Release 2 Standard S8A (Thales)

### UPDATED

Safety Beyond Standard

#### Take-Off Surveillance Landing system enhancement

ATA 22

A320 family A/C fitted with EIS2 and FMGC 3G

No OEB

#### > Description of safety topic

The following safety enhancement has been developed and introduced in FMS2 Release 2 standard S8A:

- TOS1 improvements;
- TOS2 function capability;
- FLS and FINAL APP coexistence capability.

#### > Available enhancements

New Thales FMS2 Release 2 standard S8A are associated to FG PC20/PI18 and subject to Airbus monitored retrofit campaign:

- S8APC20 HW1 CEO: **SB A320-22-1823**, RIL SA22FM2200391;
- S8APC20 HW1 NEO: **SB A320-22-1822**, RIL SA22M21002334;
- S8API18 HW1 NEO: **SB A320-22-1824**, RIL SA22M21003904;
- S8API18 HW1 CEO: **SB A320-22-1825**, RIL SA22FM2200445;
- S8API18 HW4: **SB A320-22-1826** (CEO) and **A320-22-1827**(NEO), RIL SA22M21003922;
- S8APC20 HW4: **SB 2A320-2-1828** (NEO) and **A320-22-1829** (CEO), RIL SA22M21003923.

#### > Other references

- ISI 22.83.00003 – FMGC – Evolution and interchangeability

#### > Contacts

For more information on the monitored retrofit campaign please contact Retrofit Operations at the following email address [monitored.retrofit@airbus.com](mailto:monitored.retrofit@airbus.com)

## Activation of the Automatic NAV mode engagement at Go Around

#### Go Around enhancement Decrease crew workload during Go Around

ATA 22

A320 family A/C fitted with FMGC 2G

No OEB

#### > Description of safety topic

The “NAV mode in Go Around” function has been developed to reduce the crew workload, and limit the potential deviations from the required flight path when performing a Go Around.

#### > Available enhancements

In case of Go Around, this enhancement enables the flight crew:

- To keep the NAV mode engaged; or
- To automatically arm the NAV mode that avoids pilot action on the HDG/TRK selector knob.

This function may be activated via pin programming:

- **SB A320-22-1296**.

Note: Modification required as part of RNP AR package.

Refer to section “AP/FD Logic Enhancement” for further information on availability.

#### > Aircraft prerequisites

This function requires at least the following FMGC standards:

- **SB A320-22-1244**: Introduction of FMGC standard P1I11;
- **SB A320-22-1246**: Introduction of FMGC standard S4I11;
- **SB A320-22-1247**: Introduction of FMGC standard S4C12;
- **SB A320-22-1248**: Introduction of FMGC standard P1C12.

#### > Other references

- ISI 22.83.00003
- Article in Safety First N°11

## AP/FD logics enhancement

### UPDATED

#### Enhancements of AP engagement logics Enhancements of FD engagement logics

ATA 22

All A320 family A/C

No OEB

#### > Description of safety topic

Enhancements of the AP/FD engagement logics have been developed.

#### > Available enhancements

The modifications introduce the following enhancements:

- In Alternate Law, introduce automatic Autopilot disengagement at VLS-10kts and Vmo/ Mmo +6kts;
- AP & FD disengagement at STALL warning (Alternate Law and Direct Law);
- FD will not re-engage automatically after an automatic disengagement.

Modification requires applicable standard of FAC and FMGC as follows:

- FMGC 2G: For IAE/PW engines H2CI15 (**A320-22-1547**) or S7AI15 (**A320-22-1544**),
- FMGC 2G: For CFM engines – S7AC14 (**A320-22-1545**) or H2CC14 (**A320-22-1523**);

-OR-

- FMGC3G: For IAE/PW engines – H2CPI16 (**A320-22-1605** or **A320-22-1606**); S7BPI16 (**A320-22-1607** or **A320-22-1608**),
- FMGC 3G: For CFM engines – H2CPC18 (**A320-22-1609** or **A320-22-1610**) or S7BPC18 (**A320-22-1603** or **A320-22-1604**);

-AND-

- FAC B624 – **SB A320-22-1516** or **A320-22-1553**;

-OR-

- FAC CAA03 – **SB A320- 22-1539** or **A320-22-1554**.

#### > Additional benefits

OEB 41 are cancelled by Honeywell FMS2 release 1A standard H2C.

#### > Other references

- Presentation 20<sup>th</sup> and 22<sup>nd</sup> Flight Safety Conference

## Tail strike indication on PFD and “PITCH PITCH” call out at landing

#### Tail strike prevention

ATA 22

All A320/A321 A/C

No OEB

#### > Description of safety topic

Enhancement of pilot awareness to potential tail strike during landing by:

- A pitch limit indicator on the Primary Flight Display, which is displayed at landing below 400 feet AGL;
- A “PITCH PITCH” call out, activated at landing when the pitch is greater than a certain threshold.

#### > Available enhancements

For A/C with EIS1, activation of call out only at landing via:

- **SB A320-22-1259**.

For aircraft with EIS2 activation of call out and Pitch Limit Indicator via pin programming:

- **SB A320-22-1294**.

#### > Aircraft prerequisites

Activation of call out function requires at least the following FWC and FAC standards or subsequent:

- **SB A320-22-1226**: Introduction of FAC standard BAM0619.

Tail strike indication on PFD requires at least the following EIS2, FAC and FMGC standards or subsequent:

- **SB A320-31-1276** or **SB A320-31-1271**: Introduction of EIS2 standard S7;
- **SB A320-22-1226**: Introduction of FAC standard BAM0619.

For IAE/PW Engines:

- **SB A320-22-1244**: Introduction of FMGC standard P1I11;
- **SB A320-22-1246**: Introduction of FMGC standard S4I11.

For CFM engines:

- **SB A320-22-1247**: Introduction of FMGC standard S4C12;
- **SB A320-22-1248**: Introduction of FMGC standard P1C12.

#### > Other references

Article in Safety First N°06.

## Introduction of FAC B625

### Enhancement of ROW/ROP function Enhancement of Characteristic Speeds

ATA 22

A320 family A/C fitted with FAC B

Cancel  
OEB 54

#### > Description of safety topic

Improvement of ROW/ROP function availability and accuracy.  
Improvement of FAC gross weight and VLS/S/F/Green dot speed computations in case of invalid FMS data.

#### > Available enhancements

Installation of FAC B625 introduces the following safety enhancements:

- Improvement of ROW/ROP stop bars computation in dry and wet conditions to avoid undue ROW/ROP activation;
- In case of degraded GPS signal affecting VFOM (Vertical Figure Of Merit), the ROW/ROP function will remain available;
- Improvement of FAC gross weight and VLS/S/F/Green dot speed computations in case of invalid FMS data.

This modification is available as follows:

- **SB A320-22-1644**, which is subject to a monitored retrofit campaign per RIL SA22M18002937.

#### > Other references

- TFU 22.83.00.015
- ISI 22.60.00004 FAC – Evolution & interchangeability

#### > Contacts

For more information on the monitored retrofit campaign, please contact Retrofit Operations at the following email address: [monitored.retrofit@airbus.com](mailto:monitored.retrofit@airbus.com)

## Introduction of FAC CAA13

### UPDATED



### Enhancement of Characteristic Speeds Enhancement of ROW/ROP function Enhancement of aircraft attitude crew awareness

ATA 22

A320 family A/C fitted with FAC C

Cancel  
OEB 54

#### > Description of safety topic

Improvement of ROW/ROP function availability and accuracy.  
FAC and FMGC pin-programming status could only be checked by wiring continuity test with multimeter that led to maintenance mistakes during pin-programming modification.

#### > Available enhancements

FAC CAA13 introduces following enhancement part of Safety Beyond Standard:

- Display of a digital estimated air speed display on the PFD in case of Unreliable Airspeed Situation (UAMM Step 2).

The installation of FAC CAA13 introduces the following safety enhancements:

- Improvement of FAC gross weight and VLS/S/F/Green dot speed computations in case of invalid FMS data;
- ROPS step 2+ availability (runway condition selector + ROPS OFF P/B);
- Fine tunings of the Runway Overrun Protection (ROP) stop distance and the Runway end Overrun Warning (ROW) ground distance;
- Address undue SURV ROW/ROP LOST messages in phase 9;
- FAC and FMGC pin-programming status is available on MCDU LRU IDENT page.

This modification requires installation of FAC CAA13 standard as follows:

- **SB A320-22-1797** (CEO);
- **SB A320-22-1798** (NEO).

These SBs are subject to a monitored retrofit through RIL SA22M2100009.

#### > Other references

- ISI 22.60.00004 – FAC – Evolution & interchangeability

#### > Contacts

For more information on the monitored retrofit campaign, please contact Retrofit Operations at the following email address: [monitored.retrofit@airbus.com](mailto:monitored.retrofit@airbus.com)

## Upgrade to Generator Control Unit standard 5.2

### Loss of AC1 BUS prevention

ATA 24

A320 family A/C fitted with GCU EM standard 5.1

No OEB

#### > Description of safety topic

Following an event during which AC1 bus was lost leading to associated systems loss, a recommendation was issued to improve the fault monitoring logic of GCU standard 5.1 to prevent the loss of AC1 bus.

#### > Available enhancements

Fault monitoring logic improved in GCU standard 5.2:

- **SB A320-24-1124.**

## Enhancement of Electrical Network Reconfiguration

### Loss of APU Generation and one main AC Busbar

ATA 24

A320 family A/C

No OEB

#### > Description of safety topic

Electrical network reconfiguration issue (non-connection of APU Generator, impossibility of electrical power transfer between main AC Busbars) due to open circuit failures of diode 1162VD.

#### > Available enhancements

**SB A320-24-1136** modifies the 103VU wiring so that the 1162VD (37/38), diodes 1164VD (43/44) and relay 6KD are no longer involved in the aircraft reconfiguration network logic. A free stage of existing relay 4XS will be used instead to achieve this contactor control logic.

#### > Other references

- TFU 24.23.00.009  
- ISI 24.00.00039

## Modification of static inverter

Safety Beyond  
Standard

### Smoke and smell prevention

ATA 24  
ATA 25

A320 family A/C

No OEB

#### > Description of safety topic

Some operators have reported the failure of the cockpit additional electrical-supply static inverter (FIN 3NA) leading to "strong acrid electrical type" smell followed by light smoke from the central pedestal in the cockpit.

The failed static inverters are fitted on their power supply board with a capacitor which can fail and overheat at a point in time leading, subsequently, to electrical smell and light smoke in the cockpit.

#### > Available enhancements

This modification consists in replacing the defective capacitor by a new one through the embodiment of **VSB 1830-25-37**.

This embodiment fulfils one of the requirements of the Airbus Inspections Service Bulletins **(SB) A320-25-1BJF** and **A320-25-1BJH**.

#### > Other references

- OIT 999.0096/16 Rev 01
- TFU 24.00.00.114

## New cockpit stowage box robust to Portable Equipment Devices lithium battery runaway

Safety Beyond  
Standard

### Enhancement of fire containment properties

ATA 25

A320 family A/C

No OEB

#### > Description of safety topic

The cockpit lateral stowage boxes may be used for the stowage of portable equipment devices powered by Lithium battery.

Airbus continuous development testing has identified that, in the event of a Lithium battery fire, the structural integrity of the stowage box, made from honeycomb, may not be ensured. This could result in reduced protection of adjacent systems, such as the cockpit oxygen mask lines.

The modification consists in changing the material of the lateral stowage boxes from honeycomb to aluminium.

The accomplishment of this modification will enhance the protection of surrounding systems in case of portable devices lithium battery fire.

#### > Available enhancements

The new folded and welded aluminium alloy stowage box provides protection to the adjacent systems providing PED runaway fire contention capability.

This new design is available for retrofit via the below listed SB's:

- **SB A320-25-1BPJ** (CEO);
- **SB A320-25-1BPK** (NEO).

The above mentioned service bulletins are subject to a monitored retrofit campaign via RIL SA25M19006138.

#### > Other references

- TFU 25.10.00063

#### > Contacts

For more information on the monitored retrofit campaign please contact Retrofit Operations at the following email address **monitored.retrofit@airbus.com**



## Introduction of new Pitot probe covers

### NEW

#### Prevention of unreliable airspeed events

ATA 25

A320 family

No OEB

##### > Description of safety topic

FOD and insects contamination can lead to Pitot probe blockage resulting in erroneous airspeed.

##### > Available enhancements

Made out of less material, the new Pitot probe cover fits tighter around the tube and mast of the Pitot probe. It offers then a better protection against FOD and insect contamination.

New Pitot probe covers have been introduced with:

- **SB A320-25-1BZJ** (CEO);
- **SB A320-25-1BZH** (NEO).

##### > Additional benefits

Tighter fit around the tube reduces inadvertent removal during windy conditions. The reduced size of the flag, reduces likelihood of damage to the fuselage paint.

## Introduction of a protection cover on cockpit seats

### NEW

#### Pilot potential injury prevention

ATA 25

A320 family

No OEB

##### > Description of safety topic

During operation of the seat adjustment mechanism, in particular cases, it is possible to trap the finger between seat and seat pedestal, which can cause crush injuries to the finger tip(s).

##### > Available enhancements

Installation of a cover to prevent positioning of the hand between the seat underside and the fixed seat base.

This enhancement can be embodied via:

- **VSB TAAI1-25-621** (seat TAAI- series);
- **VSB 2510144-25-620** (seat series PN 2510144 & 2510145).

##### > Other references

- TFU 25.11.00.025
- ISI 25.11.00003

## CIDS Standard 34D introduction

Safety Beyond  
Standard

### Spurious smoke warning prevention

ATA 26

A320 family A/C Post Mod 33100

No OEB

#### > Description of safety topic

On aircraft fitted with CIDS Smoke Detection functions (post mod 33100), spurious smoke warnings can be caused in particular circumstances, which can lead to IFTB or diversion.

#### > Available enhancements

This software is now included in new CIDS OBRM (P/N Z064H000034D) introduced via:

- **SB A320-23-1766** for CEO;
- **SB A320-23-1767** for NEO.

The above mentioned service bulletins are subject to a monitored retrofit campaign via RIL SA23M19002009.

#### > Other references

- TFU 23.73.00.112

#### > Contacts

For more information on the monitored retrofit campaign please contact Retrofit Operations at the following email address **monitored.retrofit@airbus.com**

## Introduction of Spoiler Elevator Computer software 121 and 123

Safety Beyond  
Standard

### UPDATED

### Hard landing and runway excursion prevention Enhanced ground spoilers and reversers availability

ATA 27

A320 family A/C fitted with SEC B and B'

No OEB

#### > Description of safety topic

The absence of ground spoiler extension or reverser extension contributes to increase the stopping distance during landing.

The ground spoiler extension during bounce may contribute to hard landings.

#### > Available enhancements

The SEC B' 121 and B 123 software standard are developed in order:

- To improve availability of ground spoiler in case of landing with abnormal engine throttle position;
- To reduce hard landing occurrence after a bounce;
- To improve reverse authorization.

These improvements are introduced through the following:

- **SB A320-27-1219** SEC 121 h/w B' installation;
- **SB A320-27-1230** SEC 123 h/w B installation.

#### > Other references

- OIT 999.0101/10
- Article in Safety First N°9
- FOT 999.0107/15
- TFU 27.94.00.030

## Seal improvement on spoiler actuator servovalve

### Spoiler surface runaway prevention

ATA 27

A320 family A/C

No OEB

#### > Description of safety topic

Cases of in-service spoiler uncommanded deployment have been reported due to insufficient robustness of a spoiler servocontrol servovalve internal seal. This will lead to increase the fuel consumption, and cause uncommanded roll.

In addition, uncommanded extension of spoiler 1 can lead to a degree of buffeting. It can lead, in some particular cases, to the loss of yaw damper function and reversion to Alternate law.

#### > Available enhancements

Introduction of improved seal on spoiler actuator fitted in position 2 & 3 is provided by:

- **SB A320-27-1216.**

Introduction of improved seal on spoiler actuator fitted in position 1, 4 & 5 is provided by:

- **SB A320-27-1212.**

#### > Other references

- TFU 27.64.51.002

## Activation of visual and aural indications in case of side stick dual inputs

### Side stick dual inputs prevention

ATA 27

A320 family A/C

No OEB

#### > Description of safety topic

Development of a visual and aural indication in case both pilots give simultaneous side sticks orders.

#### > Available enhancements

The visual dual input indication (green CAPT/FO sidestick priority light) is activated via FCDC or SEC pin programming:

- **SB A320-27-1113** (FCDC pin programming); or
- **SB A320-27-1104** (SEC pin programming).

The aural dual input indication is activated via FWC pin programming:

- **SB A320-31-1115;**
- **SB A320-31-1264.**

#### > Aircraft prerequisites

These functions require at least the following FCDC, FWC standards (or subsequent) and wiring provision:

- **SB A320-27-1070:** Introduction of FCDC standard 53;
- **SB A320-31-1106:** Introduction of FWC standard E2;
- **SB A320-31-1094:** Wiring provision for pin program activation on FWC.

#### > Other references

- Article in Safety First N°3

## Introduction of new Flight Control Data Concentrator (FCDC) software

### UPDATED

Safety Beyond Standard

#### Flight crew and Maintenance awareness

ATA 27

A320 family A/C

No OEB

##### > Description of safety topic

In some cases, Reverser INOP may not be indicated to flight crew prior to selection.

In addition, if an ADR is rejected by the ELAC flight control computer due to faulty air data parameters, the associated failure message generated does not easily allow the identification of which air data parameter (angle of attack or speed) is faulty.

Moreover, In case of side stick potentiometer failure detection identified by ELACs and/or ELAC X FAULT warning, the associated failure message generated does not easily allow the identification of the faulty equipment.

##### > Available enhancements

New logic has been introduced in FCDC standard 58:

- To add indication of additional cases of reverse system inoperative.
- To distinguish between the failed Air data parameter, identifying an angle of attack probe failure by generating a specific maintenance message, and in conjunction with FWC from standard H2F5 and ELAC from standard L93/L84, the appropriate ECAM alert.

The modification consists in the installation of FCDC Standard 58 through **SB A320-27-1208**.

The purpose of FCDC standard 59 is to prevent the FWC to display DIRECT LAW AT LANDING GEAR EXTENSION associated with ALTERNATE LAW prot lost with A/C fitted with sharklets and normal law without yaw damper availability.

The modification consists in the installation of FCDC standard 59 through **SB A320-27-1218** and **SB A320-27-1250**.

Note: New FCDC standard 60, which includes the previous improvements, is available and allow a better identification in case of side stick potentiometer failure.

##### > Additional benefits

Installation of FCDC 58 & onwards FCDC standards also improve:

- Flight data recording (increase recording rates of parameters, new parameters recorded) to fulfil new FAA recording rules requirements.

##### > Other references

- **VSB 115370-27-013**
- TFU 27.92.41.002

## Installation of THS cable cover

#### Prevention of flight control law reversion and loss of flight envelope protections

ATA 27

A320 family A/C

No OEB

##### > Description of safety topic

A water leak from the aft galley or toilet area can lead to ice accretion close to rudder and THS cables.

This may prevent cables from moving freely through pressure seals and eventually lead to STABILIZER JAM condition associated to reversion in alternate law.

##### > Available enhancements

Embodiment of **SB A320-27-1286** (CEO) and **SB A320-27-1287** (NEO) will prevent blockage of the THS cables through the installation of THS (and rudder) cables protection.

## Introduction of ELAC B Standard L104

NEW

Safety Beyond  
Standard

### Enhance flight envelope protections availability

ATA 27

A320 family

No OEB

#### > Available enhancements

Within Safety Beyond Standard initiative, ELAC B L104 standard is developed to reduce the threat of Loss of Control In-flight, by enhancing the flight envelope protections availability.

The ELAC B L104 standard introduces the following main SBS functions:

- Addition of the Pitch Attitude Limitation in Alternate Law (PALAL) for all CEO/NEO, except A318: pitch positive angle limitation is available in alternate law, in clean configuration with settings function of altitude. Stall potential situation is thus delayed in case of inappropriate pitch-up inputs;
- Flight envelope protections kept in case of system failures: in case of dual loss of yaw damper or dual loss of Flight Augmentation Computer (FAC), flight envelope protections are kept available, ALTN LAW is still displayed on Electronic Centralized Aircraft Monitoring (ECAM) as protections efficiency is reduced.

ELAC B L104 is introduced via:

- **SB A320-27-1305** or **SB A320-27-1306** for CEO Aircraft;
- **SB A320-27-1307** for NEO Aircraft.

These service bulletins are subject to a monitored retrofit campaign per RIL SA27D22021674.

#### > Additional benefits

Other improvements introduced by the ELAC B L104 standard are:

- Addition of unitary VCAS monitoring at lift off in order to detect abnormal low speed;
- Modifications to prevent double ailerons loss at take-off and double IRS rejection at take-off or landing due to Ny oscillations.

#### > Other references

TFU 27.93.00029

RIL SA27D22021674

#### > Contacts

For more information on the monitored retrofit campaign please contact Retrofit Operations at the following email address [monitored.retrofit@airbus.com](mailto:monitored.retrofit@airbus.com)

## Introduction of fuel leak detection function for A318/A319/A320

Safety Beyond  
Standard

### Fuel leak detection Dispatch/reliability improvement

ATA 28

A318/A319/A320 A/C

No OEB

#### > Description of safety topic

In case of incorrect identification of fuel leak, incorrect crew actions may lead to undetected loss of fuel.

#### > Available enhancements

The modification consists in the activation of the fuel leak detection function:

**SB A320-28-1214.**

#### > Aircraft prerequisites

This function requires at least the following FWC, FQIC, DMC and SDAC standards or subsequent:

- **SB A320-28-1125**: Install FQIC standard 13.10;
- **SB A320-31-1144**, **SB A320-31-1265**, **SB A320-31-1281**.

Installation of SDAC Standard H1D1 or H2D2 or H2D1 or H2E2:

- **SB A320-31-1266**: Activation of Hard Pin Programmed Functions.

#### > Other references

- OIT 999.0080/13

- TFU 28.42.00.043

## Introduction of fuel leak detection function for A321

### UPDATED

Safety Beyond Standard

#### Fuel leak detection Dispatch/reliability improvement

ATA 28

A321 A/C

No OEB

#### > Description of safety topic

In case of incorrect identification of fuel leak, incorrect crew actions may lead to undetected loss of fuel.

#### > Available enhancements

The modification consists of installation of FQIC PN B539AAM0308 (Software Stage 8.0) and modification of the pin programming of the SDAC to allow better fuel detection:

- **SB A320-28-1169**: Introduction of Stage 8.0 FQIC;
- **SB A320-28-1202**: Introduction of fuel leak detection function.

#### > Aircraft prerequisites

This function requires at least the following FWC, DMC and SDAC standards or subsequent:

- **SB A320-31-1144**, **SB A320-31-1265**, **SB A320-31-1281**.

Installation of SDAC Standard H1D1 or H2D2 or H2D1 or H2E2:

- **SB A320-31-1266**: Activation of Hard Pin Programmed Functions.

#### > Other references

- TFU 28.42.00069

## Activation of the PTU inhibition logic to prevent potential loss of hydraulic systems

Safety Beyond Standard

#### Prevention of Dual Hydraulic Loss Reduce crew workload

ATA 29

A320 family A/C

OEB 47

#### > Description of safety topic

Loss of green (or yellow) hydraulic fluid may not be immediately indicated to flight crew, depending on flight phase, due to ECAM warning and procedure inhibition.

Due to pressure decrease in the green (or yellow) hydraulic system, the PTU starts to restore the pressure but as a consequence of no fluid in the green (or yellow) hydraulic system this leads to overheat of the yellow (or green) hydraulic system resulting in a dual hydraulic loss. To prevent the hydraulic system overheat, the PTU must be switched off by the crew.

#### > Available enhancements

An enhancement has been developed in order to automate the inhibition of the PTU under above scenario. PTU inhibition needs the following modifications depending on your aircraft configuration.

- Covering A/C with no wiring provision:
  - **SB A320-29-1156**: Wiring provision installation and activation;

- Covering A/C with partial wiring provisions:
  - **SB A320-29-1115** or **SB A320-29-1147**: Diodes installation;

AND

- **SB A320-29-1126** or **SB A320-29-1145**: Function activation;

- Covering A/C with full wiring provisions:
  - **SB A320-29-1126** or **SB A320-29-1145**: Function activation.

Activation is emphasized for aircraft on which Parker Hydraulic Electrical Motor pump PN 51154-0X model are installed.

#### > Other references

- FOT 999.0001/14
- TFU 29.10.00.025
- Article in Safety First N°04
- Presentation during 19th Flight Safety Conference

## Introduction of new WHC standard

### NEW

#### Prevention of windshield loss

ATA 30

A320 family

No OEB

##### > Description of safety topic

An A319 aircraft experienced the loss of the RH side windshield in flight, during the cruise phase. Investigations determined the root of the event as local high overheating due to electrical arcing near the connector of the windshield heating system.

##### > Available enhancements

New WHC standard (PN 733903-2-2) integrates a differential protection which performs a differential current monitoring between both windshield supply phases A and B to detect a short circuit downstream the WHC.

This modification detects windshield heating system electrical leakage to trigger maintenance actions in order to avoid subsequent risk of electrical arcing and windshield structural ply damage.

The modification is internal to the WHC.

This enhancement can be embodied by application of:

- **SB A320-30-1061** (CEO);
- **SB A320-30-1062** (NEO).

##### > Aircraft prerequisites

Service Bulletin **SB A320-30-1050** (ice and rain protection – Windshield anti-icing and defogging – Install Intertechnique WHC P/N 733903-1-1) is a concurrent requirement if Mod. 151417P11485 has not been embodied before delivery.

## Stall Warning awareness enhancement



#### Flight Crew Awareness

ATA 31

A320 family A/C

No OEB

##### > Description of safety topic

To improve awareness of STALL conditions, Airbus has developed the following enhancements to the Stall Warnings:

- Red “STALL STALL” message will appear on the PFD in addition to Aural Stall Warning to reinforce Flight Crew Awareness;
- STALL warning will remain active, even at low speeds.

##### > Available enhancements

The Red “STALL STALL” message on the PFD is activated with EIS2 standard S12 and subsequent. It is also activated with HUD standard L5 and subsequent for Aircraft with HUD capability:

- **SB A320-31-1481** (NEO) / **A320-31-1482** (CEO): Introduce EIS S13-2 standard;
- **SB A320-34-1681** (CEO) / **A320-34-1682** (NEO): Introduce HUD std L6 on Captain side;
- **SB A320-34-1679** (CEO) / **A320-34-1680** (NEO): Introduce HUD std L6 on F/O side.

The Stall warning will be provided in flight when at stall warning threshold, whatever speed conditions further to installation of FWC H2F8 and subsequent.

- **SB A320-31-1490** (NEO) / **A320-31-1492** (CEO): Install FWC H2-F9D.

Note: Installation of EIS2 S13-2 and FWC H2-F9D provides capability for reversible Back Up Speed Scale (BUSS) (refer to presentation at 22nd FSC).

Please note that the latest EIS2 standards available are EIS2 S16 subject to a monitored retrofit campaign RIL SA31M19006813 (**SB 31-1576** CEO and **SB 31-1577** NEO) and EIS2 S17 proposed on a chargeable basis (**SB 31-1595** CEO and **SB 31-1596** NEO).

##### > Aircraft prerequisites

For the Red “STALL STALL” message the aircraft must be fitted with EIS2.

For the Stall warning at low speed the aircraft must also be fitted with capable ADIRU standards (Northrop Grumman, Honeywell Block II from standard AE21 and Honeywell Block III).

##### > Other references

- Presentation at 22nd Flight Safety Conference
- ISI 31.50.00065 – FWC Standard F8
- ISI 31.50.00066 – FWC Standard F9
- ISI 31.62.00007 – EIS2 Standards S12, S13, S13-1 and S13-2

##### > Contacts

For more information on the monitored retrofit campaign please contact Retrofit Operations at the following email address [monitored.retrofit@airbus.com](mailto:monitored.retrofit@airbus.com)

## Activation of AVAIL indication on Engine Warning Display (EWD)

### Engine condition awareness enhancement

ATA 31

A320 family A/C

No OEB

#### > Description of safety topic

In some cases of engine auto shut down in flight, the pilot did not notice that the engine restarted correctly and reinitiated the sequence.

#### > Available enhancements

The modification consists in activating the engine AVAIL display indication on Engine Warning Display to inform the crew of successful engine start on ground or engine relight in flight:

- **SB A320-31-1331**.

#### > Aircraft prerequisites

This function requires at least the following DMC and ECU standards, or subsequent:

- **SB A320-31-1276**: Introduction of DMC standard EIS2 S7;
- **SB A320-31-1286**: Introduction of DMC standard EIS1 V60;
- **SB A320-73-1081**: Introduction of ECU standard 5AI (CFM56-5A);
- **SB A320-73-1086**: Introduction of ECU standard 5BM (CFM56-5B);
- **SB A320-73-1082**: Introduction of EEC software SCN18 (IAE V2500-A5).

## Activation of ATC/Transponder monitoring function

### ATC/XPDR inadvertently switched OFF prevention Mid-air collision prevention

ATA 31

A320 family A/C

No OEB

#### > Description of safety topic

An investigation has identified cases of ATC/Transponder being inadvertently switched OFF leading to the loss of ATC/XPDR and TCAS functions.

A recommendation was issued to increase crew awareness of transponder (XPDR) being inadvertently switched off.

#### > Available enhancements

New ATC/XPDR monitoring function has been developed and is activated with SDAC pin programming:

- **SB A320-31-1352**;
- **SB A320-34-1459**;
- **SB A320-31-1353**.

#### > Aircraft prerequisites

This function requires at least the following SDAC and FWC standards or subsequent:

- **SB A320-31-1281**: Introduction of SDAC standard H2E2;
- **SB A320-31-1334**: Introduction of FWC standard H2F5.



## Monitoring of engine oil pressure C/Bs to ensure Thrust Reversers availability

Safety Beyond Standard

**Loss of both thrust reversers at landing prevention** ATA 31

A320 CEO family A/C

No OEB

### > Description of safety topic

On A320 family CEO A/C, there were reports of no deployment of both thrust reversers at landing, due to C/Bs 2EN1 and 2EN2 left open after a maintenance operation. These C/Bs are located on the cockpit rear panel 121VU and isolate the electrical wires linked with the Engines Oil Pressure.

Airbus has enhanced the C/B monitoring (performed by the SDAC), by adding the 2 above mentioned C/Bs. The modification implies wiring modification only.

### > Available enhancements

The monitoring of the C/B 2EN1 and 2EN2 is available through embodiment of **SB A320-31-1549** (MOD 165526).

This service bulleting is subject to an Airbus Monitored retrofit campaign ref RIL SA31M19000824.

### > Other references

- TFU 31.54.00.004

## Introduction of FWC F13

Safety Beyond Standard

**Digital back-up speed capability  
Autopilot robustness capability  
Improved flight crew situational awareness** ATA 31

A320 family A/C

No OEB

### > Description of safety topic

Airbus has developed FWC standard H2-F13 to introduce the following main evolutions:

- Safety enhancement evolutions facilitating the implementation of the Safety Beyond Standard (SBS) functionalities including:
  - Introduction of the reversible BUSS with digital back up speed (UAMM Step 2) and improved ECAM alerts helping the pilots to identify the reliable speed information, in case of unreliable airspeed situation;
  - Introduction of BANK BANK audio alerts, in the event of excessive bank angle in Alternate/Direct law;
  - Prevention of undue double simultaneous FAC reset – Introduced with FWC F12 standard;
- Improvement of monitoring in case of Engine Fuel Contamination;
- Enhancement of ENG x FUEL LEAK alerts (A320NEO only);
- Enhancement of Fuel Used/FOB Disagree logic - detection of positive fuel discrepancy;
- Introduction of Autobrake disengagement awareness enhancement (A-BRK OFF ECAM super memo, AUTOBRAKE OFF Synthetic voice audio).

For additional information and other improvements brought by FWC standard H2-F13 please refer to ISI 31.50.00077.

### > Available enhancements

FWC standard is introduced through **SB A320-31-1609** (NEO) and **SB A320-31-1608** (CEO). These service bulletins are subject to Airbus monitored retrofit campaign RIL SA31M21004114.

### > Other references

- ISI 31.50.00077

### > Contacts

For more information on the monitored retrofit campaign please contact Retrofit Operations at the following email address **monitored.retrofit@airbus.com**

## Introduction of EIS2 Standard S16

Safety Beyond  
Standard

**Digital back-up speed capability  
Improved flight crew situational awareness**

ATA 31

A320 family A/C with EIS2

No OEB

### > Description of safety topic

Airbus has developed EIS2 standard S16 to introduce the following main evolutions:

- Safety enhancement evolutions facilitating the implementation of the Safety Beyond Standard (SBS) functionalities including:
  - Reversible BUSS with digital back up speed (UAMM Step 2 function),
  - New BANK BANK red message on PFD, in the event of excessive bank angle in Alternate/Direct law,
  - ROPS step 2+: Display of runway status on ND and new ROPS message on PFD;
- Correction EIS 2 S13.2 and FDIU pre-FS2 mixability issue (TFU 31.60.00.024);
- "LVR TOGA" FMA message for CEO aircraft;
- "DISCONNECT AP FOR LDG" FMA message.

### > Available enhancements

RIL issued SA31M19006813 R00.

EIS S16 standard is introduced through **SB A320-31-1577** (NEO) & **A320-31-1576** (CEO).

### > Other references

- TFU 31.60.00070
- TFU 31.60.00.024

## Introduction of Reversible Back Up Speed Scale (BUSS) capability

Safety Beyond  
Standard

**Irreversible loss of 3 ADR  
Loss of cabin pressure regulation  
Enhancement of Unreliable Airspeed  
Situation Management**

ATA 31

A320 family A/C

No OEB

### > Description of safety topic

BUSS (Back Up Speed Scale) provides flight crew with an alternate speed scale in case of unreliable airspeed. Activation of the BUSS requires crew to select OFF the 3 ADR, which leads to the loss of automatic pressure regulation.

### > Available enhancements

- **Reversible BUSS display (UAMM Step 1)** allows the crew to reselect the ADRs speed scales when the measurements return to normal. Activation / deactivation of reversible BUSS on Primary Flight Display (PFD) is achieved by means of new pushbutton installed in the cockpit.

This enhancement is activated by **SB A320-34-1658** (CEO) or **SB A320-34-1659** (NEO).

- **The reversible BUSS with digital back up speed (UAMM step 2 function)** objective is to enhance safety by helping the pilots to detect invalid speed information and select the relevant speed information. It introduces:

- Computation of an additional backup speed independent from anemometric data;
- Information on the validity of the ADR speeds: new ECAM messages and PFD SPEED flag logic designed to inform flight crew about airspeed reliability;
- New ECAM procedure providing the appropriate ADR switching position.

The reversible BUSS with digital back up speed (UAMM Step 2 function) is activated by **SB A320-22-1738** (CEO) or **SB A320-22-1739** (NEO).

These are subject to Airbus monitored retrofit campaign RIL SA22M21002261.

### > Aircraft prerequisites

For CEO A/C refer to **SB A320-34-1658** for details.

For NEO A/C refer to **SB A320-34-1659** for details.

See referenced ISI article for UAMM Step 2.

### > Other references

- Presented during 22nd Flight Safety Conference
- ISI 31.60.00066 – UAMM Steps 1 and 2 (reversible BUSS) on SA and LR A/C equipped with EIS2
- ISI 22.00.00101 – Certify and define UAMM (Unreliable Airspeed Mitigation Means) step 2 function

## Excessive Bank Angle Alert

Safety Beyond  
Standard

### Improved flight crew situational awareness

ATA 31

A320 family A/C

No OEB

#### > Description of safety topic

In pre-mod configuration, when aircraft is not protected (non-normal law), there is no warning for excessive bank angle.

#### > Available enhancements

In post-mod configuration, when the bank angle exceeds 45 degrees in non-normal law (aircraft not protected):

- An aural alert "BANK BANK" is triggered;
- A "BANK BANK" message is displayed on PFD (and HUD if equipped).

#### > Aircraft prerequisites

BANK BANK message on PFD is introduced with EIS2 standard S16.

The associated audio alert is managed independently by FWC and introduced with FWC standard H2-F13.

Other prerequisites:

- FAC CAA12 at least;
- If HUD installed, HUD L7.

## Introduction of CFDIU Standard 14

NEW

### Detection of incorrect avionics configuration

ATA 31

A320 family A/C

No OEB

#### > Available enhancements

Installation of CFDIU standard 14 introduce the following enhancements:

- Corrects all ACR (Avionics Configuration Report) known anomalies on previous CFDIU standards;
- Allows to generate the ACR manually or automatically. When automatic transmission is selected, the frequency of emission can be customized between once every 10 flights up to once every 400 flights.

CFDIU Std 14 must be used conjointly with the Configuration Cockpit digital solution which is a ground solution for Airlines accessible from Airbus World from March 2024.

- **SB A320-31-1629 for CEO**
- **SB A320-31-1630 for NEO**

#### > Aircraft prerequisites

Aircraft must be equipped with minimum CFDIU std 9B.

#### > Other references

- ISI 45.00.00056: All A/C families Dataloading – A/C FLS List retrieval

#### > Other data

- Configuration in part coming from Airline MIS
- Article in Safety First N°32

## Introduction of BSCU standard L4.10

### UPDATED

#### Enhanced Awareness linked to Braking and Steering

ATA 32

A320 family A/C

No OEB

##### > Description of safety topic

In BSCU L4.9B Standard:

- Failure of Landing Gear lever could lead to inhibition of pre-land test with no cockpit effect;
- Failure of Parking Brake selector valve can lead to Residual braking with no cockpit effect.

##### > Available enhancements

With BSCU L4.10, there is additional cockpit awareness for these failure conditions:

- **SB A320-32-1432.**

##### > Aircraft prerequisites

The improvement related to the residual braking detection function requires at least the following SDAC and FWC standards or subsequent:

- SDAC Standard H2E3 (**SB A320-31-1374**);
- FWC Standard H2F9.

##### > Other references

For other improvements covered by this new BSCU standard refer to:

- TFU 32.42.34.053 – BRAKES RELEASED / AUTO BRK FAULT AT LANDING;
- TFU 32.42.00.055 – Intermittent BRAKE SYS 1(2) FAULT ECAM warning – Normal Brake Servovalve Faults;
- TFU 32.51.00.027 – NWS fault due to spurious electrical box failure.

## Activation of the parking brake monitoring function



#### Unexpected parking brake activation prevention

ATA 32

A320 family A/C

No OEB

##### > Description of safety topic

Unexpected parking brake application may occur:

- Either if the parking brake has been inadvertently set in flight;
- Or upon failure conditions.

##### > Available enhancements

New parking brake monitoring logic was introduced in FWC standard H2F5 to enable detection of discrepancy between the parking brake handle position and the parking brake Selector Valve and trigger appropriate ECAM warning.

In order to activate the parking brake monitoring function, an additional wiring is needed, running from the SDAC to the parking brake handle:

- **SB A320-32-1381**;
- **SB A320-31-1353.**

##### > Aircraft prerequisites

This function requires at least the following SDAC and FWC standards or subsequent:

- **SB A320-31-1281**: Introduction of SDAC standard H2E2;
- **SB A320-31-1334**: Introduction of FWC standard H2F5.

##### > Other references

- TFU 32.45.51.002

## MLG Lock Stay Actuator Hose

Safety Beyond Standard

### Green hydraulic loss prevention

ATA 32

A319/A320/A321 A/C

No OEB

#### > Description of safety topic

Airbus has been reported swivel joint ruptures of the MLG lock-stay actuator hoses due to stress corrosion.

Such defect can lead to significant leak and loss of the green hydraulic system.

#### > Available enhancements

A new flexible hose from Parker/Stratoflex has been introduced as a direct replacement for the EATON flexible hose. The Parker/Stratoflex flexible hose is manufactured from 15-5PH stainless steel that has a superior resistance to stress corrosion than the EATON flexible hose.

- **SB A320-32-1364:** Main Landing Gear – Enhance lock stay actuator hose stress resistance to corrosion

## Improved MLG door actuator hose

Safety Beyond Standard

### Green hydraulic loss prevention

ATA 32

A320 family A/C

No OEB

#### > Description of safety topic

Several cases of Green hydraulic system loss due to hose breakage/leakage of the Main Landing Gear (MLG) door actuator supply line have been reported. The hoses were found fractured by fatigue due to the stress applied during MLG door operation.

#### > Available enhancements

A new hose design is available via:

- **SB A320-32-1371.**

#### > Other references

- TFU 32.31.35.003
- ISI 29.00.00013
- ISI 32.31.00099

## LG Door Bypass Valves

### Prevention of Inadvertent LG Door Closure

ATA 32

A320 family A/C

No OEB

#### > Description of safety topic

Landing Gear (LG) door bypass valves are designed to prevent movement of the Ground Door Opening Panel (GDOP) handle to the stowed position when the green hydraulic system is depressurized during maintenance operations. This avoids inadvertent closure of the doors when hydraulic pressure is restored.

Residual hydraulic pressure present can lead to the possibility of the GDOP handle being moved to the stowed position for a short period after switching off the green hydraulic power, which could lead to inadvertent closure of the doors on restoration of the hydraulic power, if process is not correctly followed.

#### > Available enhancements

The new door bypass valve (PN 114087010) increases the internal leakage and decreases the time required for pressure to dissipate in the door close line once the green hydraulic system has been de-pressurised.

This prevents the moving of the Landing gear Door Bypass valve handle to CLOSED, and inadvertent closure of the landing gear doors if process is not correctly followed.

- **SB A320-32-1436**

#### > Other references

- Triumph Actuation Systems **VS No. 114087-32-102**

## Introduction of change in Autobrake mode low settings and new high capacity brakes



### Voluntary Autobrake disconnection prevention

ATA 32

A319/A320/A321 A/C

No OEB

#### > Description of safety topic

Airbus has been reported of cases of manual braking override resulting from lack of braking engagement perception in Autobrake Mode Low.

Frequent Manual braking override, coupled with demanding operations for the brakes (high altitude operations, high payload, Fuel saving techniques at landing) could lead to increased brake wear, and more likelihood of rupture of brakes.

#### > Available enhancements

Change of Auto Brake setting allow to improve perception of braking engagement and reduce cases of consequential disconnection with the pedals is available through embodiment of:

- **SB A320-32-1464** for A319/A320 CEO;
- **SB A320-32-1476** for A321 CEO;
- **SB A320-32-1465** for A320 NEO;
- **SB A320-32-1477** for A321 NEO.

High capacity brakes PN 2-1759 have been developed for A319 and A320 by Collins and are available through RFC/RMO.

#### > Other references

- TFU 32.42.00.042

## Modification of the inflation pressure of Yellow park brake accumulator

Safety Beyond Standard

### Loss of emergency braking prevention

ATA 32

A319/A320/A321 A/C pre mod 30079

No OEB

#### > Description of safety topic

In certain cases, an internal leakage rate of alternate brake system can lead to a brake accumulator pressure decrease and consequently to a reduced availability of the Emergency Braking in the event of a dual loss of Yellow and Green Hydraulic systems.

#### > Available enhancements

Installation of a label and update of AMM task which reduces the charging pressure of the accumulator to from 100 bars to 70 bars in order to optimize the volume of pressurized fluid available in the brake accumulator in case of dual (yellow + green) hydraulic pressure loss. AMM task is modified accordingly :

- **SB A320-32-1215** – Decrease inflation pressure of yellow brake accumulator.

An additional modification (**SB A320-32-1470** for CEO A/C and **A320-32-1471** for NEO A/C) increases the servicing again from 70 bars to 80 bars and also increases the acceptable drop between two MPD checks from 15 bars to 20 bars. The aim of this change is to decrease the rate of accumulator NFF by increasing the allowable pressure drop between two successive MPD checks (see TFU 32.44.00.004).

Both SB's (32-1215 AND 32-1470 or 32-1215 AND 32-1471) are to be performed.

#### > Other references

- **ISI 32.44.00001** – Alternate Braking – Brake accumulator
- **TFU 32.44.11.003** – Alternate Accumulator Pressure Check
- **TFU 32.44.00.004** – Brake Accumulator Pressure Loss

## Modified NLG Torque Link Apex Pin assembly

NEW

### To prevent loss of steering and nose wheels at 90 degrees during taxi or landing

ATA 32

A320 family A/C

No OEB

#### > Description of safety topic

There have been several cases of NLG Apex Pin rupturing. This failure can result in the loss of nose wheel steering or nose wheel at 90 degrees.

#### > Available enhancements

A new design of the NLG torque link apex pin assembly has been developed and qualified with Safran Landing Systems to improve resistance of the apex pin and nut against corrosion.

This design should also decrease the exposure to towbarless tractor impact observed in service:

- **SB A320-32-1514** (CEO);
- **SB A320-32-1513** (NEO).

#### > Additional benefits

This new design of the NLG apex pin assembly is the terminating action of the repetitive Inspection **SB A320-32-1500** and **SB A320-32-1501**.

#### > Other references

- TFU 32.21.00087

## Improved 24/25GA proximity sensor mechanism

### Prevention of NLG retraction issues Prevention of Autopilot and Autothrust disconnection in flight

ATA 32

A320 family

No OEB

#### > Description of safety topic

Excessive free play due to wear in the flight/ground sensing mechanism is at the origin of a significant number of faults related to 24GA and 25GA prox sensors. A dual fault affecting both the 24GA and 25GA prox sensors during take off will prevent the NLG to retract and lead to disconnection of the AP/ATHR during flight.

#### > Available enhancements

Design change in the NLG flight/ground sensing mechanism to improve its robustness against wear and reduce its sensitivity to free play:

- **SB A320-32-1474** (CEO) and **A320-32-1475** (NEO) – Improved mechanism for NLG position detection.

#### > Other references

- TFU 32.21.00.017

## Implementation of the heat shrink colour coding on the landing gear tachometer harness



### Cross connection tachometer harnesses prevention

ATA 32

A320 family A/C

No OEB

#### > Description of safety topic

A number of cases have been reported where the tachometers were cross connected on the landing gear.

The consequence is the loss of anti-skid on one wheel and loss of the braking pressure on the adjacent one if anti-skid is active. This can lead to reduced controllability on ground and thus potentially to runway excursion.

#### > Available enhancements

A new heat shrink colour coding of the tachometer harnesses has been implemented in order to enhance identification of the tachometer harness to prevent cross connection:

- **SB A320-32-1395**.

#### > Other references

- OIT 999.0133/07
- Article in Safety first N°07



## Introduction of static pressure lines disconnection monitoring

### UPDATED

#### Prevention of unreliable airspeed and altitude events

ATA 34

All A320 family A/C fitted with Honeywell ADIRU pre P/N HG2030AE21

No OEB

#### > Description of safety topic

In case of pressure line disconnection between the static probe and the Air Data Module (ADM) the pressure measured by the ADM is incorrect.

In case of multiple pressure line disconnections, this may lead to multiple erroneous displays in the cockpit (standby/Captain/First Officer) presenting similar but wrong altitude and airspeed information.

#### > Available enhancements

A new ADR monitoring is available from Honeywell ADIRU PN HG2030AE21. If the difference between left and right static pressure is greater than 30mbar, the associated ADR FAULT warning message is triggered on ECAM. The latest Honeywell ADIRU block II (embedding improvement introduced by HG2030AE21) is the PN HG2030AE24 or HG2030AE44:

- **SB A320-34-1573:** Introduction of ADIRU PN HG2030AE24 (from P/N HG2030AE23);
- **SB A320-34-1599:** Introduction of HG2030AE44 (from HG2030AE24 or HG2030AE43).

Note: All Northrop Grumman ADIRUs on the A320 family fleet have this new monitoring (ADIRUs PN above 465050-0303-0314).

#### > Additional benefits

ADIRU PN HG2030AE25/HG2030AE45 also brings the following enhancements:

- Update of MAGVAR map with 2015 coefficients optimized for 2020;
- Gyro Life Monitoring monitoring.

#### > Other references

- OIT 999.0032/08

## Introduction of static pressure probes obstruction monitoring on ground

#### Prevention of unreliable airspeed and altitude events

ATA 34

A320 family A/C

No OEB

#### > Description of safety topic

Non-detection of obstructed static pressure probes on ground in some specific cases leading to erroneous altitude or airspeed information during the flight.

#### > Available enhancements

On-ground static pressure monitoring function may be activated via new wires installation and SDAC pin programming:

- **SB A320-34-1563:** Define static probe monitoring on ground function.

#### > Aircraft prerequisites

This function requires at least the following FWC and SDAC standards:

- **SB A320-31-1373:** Introduction of FWC standard H2F6 (or subsequent subject to monitored retrofit and airworthiness directive);
- **SB A320-31-1374:** Introduction of SDAC standard H2E3.

## Flight Path Angle Availability improvement

### Flight crew awareness

ATA 34

A320 family A/C fitted with Honeywell ADIRU

No OEB

#### > Description of safety topic

This modification introduces an improvement of the Flight Path Angle (FPA) availability in the case of loss of airspeed.

#### > Available enhancements

The following safety enhancements are available:

- **SB A320-34-1573**: introduction of Honeywell ADIRU standard PN HG2030AE24;
- **SB A320-34-1599**: introduction of HG2030AE44 (from HG2030AE24 or HG2030AE43);
- **SB A320-34-1527**: introduction of Honeywell ADIRU standard PN HG2030BExx std L4.2.

#### > Other references

- Honeywell **VSB HG2030AE-34-0011** converts ADxx and AExx to AE24;
- The latest Honeywell ADIRU block II (embedding improvement introduced by HG2030AE24) is the PN HG2030AE25 or HG2030AE45:
  - **SB A320-34-1818**: Introduction of ADIRU PN HG2030AE25 (from P/N HG2030AE24),
  - **SB A320-34-1819**: Introduction of HG2030AE45 (from HG2030AE25 or HG2030AE44),
- **VSB HG2030BE-34-0007** converts L4.1 to L4.2;
- ISI 34.12.00003 ADIRU mixability matrices.

## Improved initialization function during ADIRS alignment

### Simplification of ADIRU alignment to prevent loss navigation data

ATA 34

A320 family A/C pre mod 33240

No OEB

#### > Description of safety topic

Incorrect aircraft position entry during Air Data Inertial Reference Unit (ADIRU) alignment can lead to incorrect indication on the Navigation Display and erroneous heading indication during take-off.

#### > Available enhancements

This enhancement introduces:

- Automatic position initialization;
- Cross-check of manual initialization position with GPS position;
- Shortened alignment time.

This enhancement is activated by modification of ADIRU 1-3 pin-programming:

- **SB A320-34-1550**: Activate Alignment Improvement Function on ADIRU.

#### > Aircraft prerequisites

The improved ADIRU alignment function requires the aircraft to be fitted with:

- HONEYWELL ADIRU PN HG2030AE21 (or subsequent PN) and Global Positioning System Sensor Unit (GPSSU) or Multi-Mode Receiver (MMR);

OR

- Any HONEYWELL ADIRU PN HG2030BExx;

OR

- LITTON ADIRU PN 465020-0303-0314 (or subsequent PN) and MMR.

Note: the latest Honeywell ADIRU block II (embedding improvement introduced by HG2030AE21) is the PN HG2030AE25 or HG2030AE45:

- **SB A320-34-1818**: Introduction of ADIRU PN HG2030AE25 (from P/N HG2030AE24);
- **SB A320-34-1819**: Introduction of HG2030AE45 (from HG2030AE25 or HG2030AE44).

#### > Other references

- ISI 34.10.00006 – ADIRU alignment and maintenance recommendations

## Introduction of new Pitot probe PN 0851MC

### Prevention of unreliable airspeed events

ATA 34

A320 family A/C

No OEB

#### > Description of safety topic

Isolated cases of Pitot probe blockage due to icing are experienced in service with the current installed probes Collins PN 0851HL, which meet all applicable certification requirements.

#### > Available enhancements

Airbus and its supplier (Collins), have developed new Pitot probes PN 0851MC, which are certified to more stringent icing conditions: CS25 Appendix P (Mixed phase and Ice crystals) and CS25 appendix O (Supercooled large Droplet).

This is embodied by the following SBs:

- **SB A320-34-1678** (CEO);
- **SB A320-34-1731** (NEO).

#### > Other references

- TFU 34.11.00.017
- ISI 34.11.00026

## Installation of Thales Angle of Attack Probe on the Standby position

### Standby Angle of Attack probe blockage robustness enhancement

ATA 34

A320 family A/C fitted with UTAS AoA probe

No OEB

#### > Description of safety topic

AOA probe blockage may occur in very specific weather conditions when water droplets from the atmosphere are trapped between the moving vane of the AOA probe and the AOA exterior face plate, becoming frozen while A/C is climbing.

Detailed analysis demonstrated that Collins AOA probe PN 0861ED and PN 0861ED2 are potentially affected by this blockage mode.

#### > Available enhancements

This modification installs Thales AOA probe PN C16291AB on standby position instead of UTAS AoA probe PN 0861ED or PN 0861ED2.



UTAS AOA probe



Thales AOA probe

Thales AOA probe PN C16291AB can be installed on standby position via **SB A320-34-1611**.

#### > Additional benefits

Cancelation of **ISB A320-34-1415** (inspection of UTAS AOA probes for damaged o-ring) – Applicable to PN 0861ED only.

#### > Other references

- OIT 999.0015/15 rev 01
- TFU 34.11.00.011
- ISI 34.10.00007

## Introduction of new bi-colored Pitot and AOA probes markings on fuselage

### Pitot and AOA probes on-ground damage prevention

ATA 34

A320 family A/C

No OEB

#### > Description of safety topic

Pitot probes and Angle of Attack (AOA) probes may be damaged on ground due to inadvertent impact (with jetways for instance).

#### > Available enhancements

Addition of bi-colored markings around Pitot and AOA probes to better highlight the sensitivity of this equipment.

This modification can be embodied thanks to **SB A320-11-1120**.

#### > Other references

- ISI 34.11.00026 – A320FAM and A330/A340 Pitot probes – Description, evolutions and maintenance recommendations
- ISI 34.10.00007 – A320FAM and A330/A340 Angle Of Attack (AOA) probes – Description, evolutions and maintenance recommendations

## Honeywell Radio Altimeter ALA52B-0232 and -0432: coupling issue correction

### Erroneous radio altitude data prevention

ATA 34

A320 family A/C fitted with Honeywell Radio Altimeters PN 066-50007-0222

No OEB

#### > Description of safety topic

Direct radio signal coupling between receivers and transceivers antennas may cause erroneous radio altitude data (-6ft) in approach with ALA-52B PN 066-50007-0222.

#### > Available enhancements

Introduction of a software on the Honeywell Radio Altimeter ALA52B:

- **PN 066-50007-0232: SB A320-34-1510;**
- **PN 066-50007-0432: SB A320-34-1515.**

#### > Aircraft prerequisites

Some prerequisites may exist concerning the standard of RA antenna installed. Please consult the paragraph "CONCURRENT REQUIREMENTS" of the concerned SB for more information.

#### > Other references

- TFU 34.42.00.023

## Improved TAT probes

### Improvement of Autopilot and Auto Thrust availability

ATA 34

A320 family A/C

No OEB

#### > Description of safety topic

Failure of the two sensing elements inside the Captain Total Air Temperature (TAT) probe can lead to loss of Flight Director, Autopilot and Autothrust.

#### > Available enhancements

Replacement of the current TAT probe with an improved one, in order to improve robustness of the TAT two element sensing elements.

Depending on aircraft configuration there are three types of TAT that could be installed:

- **SB A320-34-1331**: Installation of AUXITROL "NON-ASPIRATED" TAT Probe PN RP350-00;
- **SB A320-34-1382**: Introduction of UTAS "NON-ASPIRATED" TAT Probe PN 0102ME2GE;
- **SB A320-34-1407**: Introduction of UTAS "ASPIRATED" TAT Probe PN 0102LM2GE.

#### > Other references

- TFU 34.10.00.015 – Dual breakdown of TAT sensing elements
- ISI 34.11.00027 – A320FAM and A330/A340 Total Air Temperature (TAT) probes – Description, evolutions and maintenance recommendations

#### > Other data

- On A320 aircraft: Installation of FAC620 or later allows retention of AP2/FD2 and ATHR in case of Captain TAT failure
- On A318/A319/A321 aircraft: Installation of FG C13/I12 (or subsequent) allows retention of FD2 and ATHR in case of Captain TAT failure
- On A318/A319/A321 aircraft: Installation of FG C13/I12 (or subsequent) and FAC 620 (or equivalent) allows retention of AP2/FD2 and ATHR in case of Captain TAT failure

## EGPWS post -002 for enhanced TCF protection

NEW

Safety Beyond Standard

### EGPWS with enhanced Terrain Clearance Floor (TCF) protection

ATA 34

A320 family A/C

No OEB

#### > Description of safety topic

Lessons learnt from a near Controlled Flight Into Terrain (CFIT) due to an incorrect barometric pressure provided by the ATC.

#### > Available enhancements

The EGPWS post PN 965-1676-002 are fitted with an enhanced Terrain Clearance Floor (TCF) protection with an inhibition fitted closer to the runway threshold, thus enhancing the coverage and prevention of undershoot or CFIT scenarios during final approach.

- **SB A320-34-1412** Install EGPWC PN 965-1676-003

#### > Other references

**SB A320-34-1345**: Install EGPWS capable of using the GPS lateral position and activation of peaks and obstacles functions.

## Improved electrical installation of RA antennas

### Prevention of loss of radio altitude

ATA 34

A320 family A/C

No OEB

#### > Description of safety topic

Moisture ingress at radio altimeter connectors can affect radio altimeter operation, and consequently lead to loss of radio altitude indication during approach/landing.

#### > Available enhancements

New electrical installation for RA antennas to improve the sealing of the radio altimeter antennas connectors with:

- **SB A320-92-1030**: Improve electrical installation for antennas.

#### > Aircraft prerequisites

It is recommended to perform **SB A320-34-1476** (Install a new gasket between radio altimeter antenna and a/c skin) at the same time.

#### > Other references

- TFU 34.42.00.017
- ISI 34.42.00005
- Article in FAST 49
- Article in Safety First N°11

## Introduction of modification packages to prevent a bleed loss

### UPDATED

### Cabin depressurization prevention IFTB/Diversion/Emergency descent prevention

ATA 36

A320 CEO family A/C

No OEB

#### > Description of safety topic

A dual engine bleed loss can lead to an IFTB, a diversion or an emergency descent due to loss of cabin pressurization.

#### > Available enhancements

For A320 family CEO aircraft, two modification packages have been introduced to prevent a dual bleed loss.

The following modification package addresses the overpressure issues (in particular during take-off):

- **SB A320-36-1075 / VSB 733901-36-002**: Introduction of BMC std 12;
- **SB A320-36-1076 / VSB 6740-36-05**: Introduction of OPV G;
- **SB A320-36-1077** Wiring between Pack P/Band BMC (ACSC Conf);
- **SB A320-36-1080** Wiring between Pack P/B and BMC (PC/ZC Conf).

The following modification package addresses the overtemperature issues:

- **SB A320-36-1061**: Introduction of new TCT (7170HM) PN 342B050000;
- Liebherr **VSB 6730F-36-01** or **6730-36-03**: FAV (9HA) F01 standard or C01 – standard modification;
- Liebherr **VSB 341F-36-01**: TLT (10HA) F02 standard modification.

#### > Additional benefits

Introduction of the modification package will improve the overall bleed reliability.

#### > Other references

- VSIL LS6740-36-03 for OPV G
- VSIL 733901-36-003 for BMC STD12

## Introduction of new HPV

### UPDATED

Safety Beyond  
Standard

#### Cabin depressurization prevention IFTB/Diversions/Emergency descent prevention

ATA 36

A320 NEO family A/C

No OEB

#### > Description of safety topic

Dual engine bleed loss can lead to an emergency descent due to loss of cabin pressurization.

#### > Available enhancements

The following mitigation and modification will avoid some HPV failed OPEN or CLOSED and reduce dual bleed loss rate:

- Liebherr SIL LS70645-36-01 for preventive replacement of HPV clip in shop;
- Liebherr **VSB 70645-36-01** introduction of modified HPV PN 70645A020001 AMDT A with purified graphite material.

A new modification introduces design modifications and improvements on HPV:

- Liebherr **VSB 70645-36-02** and Airbus cover **SB A320-36-1091**.

#### > Other references

- TFU 36.11.00106 A320FAM neo – HPV failed open leading to AIR ENG BLEED FAULT
- TFU 36.11.00.115 A320FAM neo – AIR ENG HP VALVE FAULT

## Over Heat Detection System (OHDS) improvements including Gold Plating of Connectors

### UPDATED

Safety Beyond  
Standard

#### Bleed Leak Detection Cabin depressurization prevention

ATA 36

A320 family A/C

No OEB

#### > Description of safety topic

Improved OHDS mating cables (with gold plated connectors) and length increase (for CEO only) have been developed to prevent from oxidation/corrosion and breakage (for CEO only) potentially leading to LOOP INOP messages.

#### > Available enhancements

New mating cables with gold plating on the connectors to increase robustness:

NEO Aircraft:

- **SB A320-36-1071** for the APU loop,
- **SB A320-36-1072** – Pylon loops on CFM LEAP,
- **SB A320-36-1073** – Pylon loops on PW 1100,
- **SB A320-36-1074** – Wing loops;

CEO Aircraft:

- **SB A320-36-1081**.

#### > Other references

- **TFU 36.22.00.030** – OHDS Loop inop on A/C with mating connectors
- **TFU 36.22.00.032** A320FAM CEO- OHDS Loop Inop messages

## Modification of precooler exhaust

### NEW

#### Loss of bleed prevention

ATA 36

A320 family NEO A/C fitted with PW engines

No OEB

#### > Description of safety topic

ECAM Warning AIR ENG 1(2) BLEED LEAK associated with fault message ENG1(2) PYLON LEAK were reported on recently delivered aircraft powered with PW engines.

Ultimately, dual bleed loss could occur.

#### > Available enhancements

For A/C in production, a modification has been developed, consisting in:

- Deleting the overpressure flap door of the Pre-cooler panel;
- Plugging the assembly holes of the Pre-cooler panel.

The modification **SB A320-54-1048** has been developed, consisting in:

- Replacing the exchange box assy of the pre-cooler panel with a new one, keeping the grid assy.

#### > Other references

TFU 36.10.00.002

## Corrective ATSU SW standard CSB7.5 & 7.5.1

#### Loss of communication prevention

ATA 46

A320 family A/C

No OEB

#### > Description of safety topic

##### **CSB 7.5**

A320 DATALINK CSB/CLR7.2 and CSB/CLR7.4 Issue: ACK and TOSS.

Some ATC ground centres have experienced some cases in which they didn't receive the flight crew answer to their CPDLC (FANS A ATC) uplink datalink message requests.

Some Airlines have experienced some cases in which the flight crew didn't receive the ATC ground centre and Airline AOC centre answers to their CPDLC (FANS A ATC) and AOC downlinks messages requests. However, there were no fault indications in the flight-deck.

##### **CSB 7.5.1**

Incompatibility found between ATSU SW CSB 7.5 and HW40 and 50. As consequence, SBs cannot be applied on a/c fitted with ATSU HW40 and HW50.

#### > Available enhancements

Corrective ATSU SW standard CSB7.5 for a/c currently on CSB7.4 FANS A+ configuration:

- **SB A320-46-1172** (CEO);
- **SB A320-46-1173** (NEO).

#### > Other references

TFU 46.21.00.006



## APU – Air intake system

### NEW

#### Bleed air contamination prevention

ATA 49

A320 family A/C

No OEB

##### > Description of safety topic

During APU testing, some fluid was detected entering to the air intake diffuser through a hole performed in drain pipe to install it in the APU air intake diffuser side wall. This could lead to Bleed air contamination. This drain pipe was introduced by the **SB A320-49-1049**.

##### > Available enhancements

Improvement of the sealing of drain pipe to the sidewall of the air intake diffuser is available with the following:

- **SB A320-49-1116** (CEO);
- **SB A320-49-1117** (NEO).

## New cargo door handles cover

#### In-flight cargo door handle unlocking prevention

ATA 52

A320 family

No OEB

##### > Description of safety topic

In service experience has shown that in exceptional cases the cargo door handle can unlock. Following an inflight impact, the aero- or hydro-mechanical flow can potentially action the cargo door handle and unlock a cargo door of a non-pressurized aircraft.

##### > Available enhancements

The Service Bulletin **SB A320-52-1174** introduces a new cargo door handle incorporating a securing device push button. It describes the replacement of the FWD and AFT Cargo Door Handles by new designed units with the securing device push button.

Accomplishment of this Service Bulletin will contribute to avoid unlocking of the cargo door handle following an in-flight impact on a non-pressurized aircraft.

## Introduction of new refuel panel door (192MB)

### Parts Departing Aircraft prevention

ATA 53

All A319/A320/A321 A/C pre mod 32361P7541  
fitted with refuel panel door on fuselage

No OEB

#### > Description of safety topic

Incorrect closing of the fuselage refuel panel door can lead to detachment in flight.

#### > Available enhancements

Re-orientation of the refuel panel door, so that it opens in line with the airflow. Consequently, if left unclosed the refuel panel door will close due to the airflow.

This enhancement can be embodied by either:

- **SB A320- 53-1164** – Serial solution – Will provide the rework procedure of the existing panel 192LB and a kit including new door and fittings;
- **SB A320-53-1189** – Simplified Solution. This Door 192MB will not be interchangeable with serial solution.



Pre Mod



Post Mod

#### > Other references

- TFU 52.42.00.011 – Fuel Panel Door 192MB / In-flight losses
- TFU 52.42.00.013 – In-flight loss of Fuel Panel access Door 192MB
- ISI 00.00.00184 – Part Departing from Aircraft – Available solutions avoiding event

## Introduction of new Blue hydraulic service panel door (197FB)

### Parts Departing Aircraft prevention

ATA 53

A320 family A/C pre mod 158401

No OEB

#### > Description of safety topic

Incorrect closing and latching of the access door 197FB can lead to detachment in flight.

#### > Available enhancements

Modification of the access door 197FB, such that it is less likely to detach in flight. The enhancements include:

- Introduction of more solid hinges for the access door;
- Replacement of hooks and latches for the access door – Two instead of one.

This enhancement can be embodied by application of:

- **SB A320-53-1323** – Rear fuselage – Redesign the connection of the service door for 197FB.



Pre Mod



Post Mod

#### > Other references

- TFU 52.40.00.002 – Damage hinges/latches and loss of service doors (197FB, 197CB, 197EB)
- ISI 00.00.00184 – Part Departing from Aircraft – Available solutions avoiding event

## Introduction of improved oil filler door latches on IAE V2500

### Parts Departing Aircraft prevention

ATA 71

All A319/A320/A321 A/C pre mod 155785 fitted with IAE Engines

No OEB

#### > Description of safety topic

Incorrect closing of the Oil Refuel Panel door latches can lead to the refuel panel door to detach in flight due to scooping effect.

#### > Available enhancements

Installation of a new latch, Part Number HA2153-1, featuring an additional torsion spring and increased latch poundage.

This ensures it does not remain in an intermediate position, whenever incorrectly latched, and allows better detection of incorrectly closed Oil Filler Doors.

This enhancement can be embodied by: **SB A320-71-1061** – Fan cowl doors – Introduce an improved oil filler door latch design on IAE engine.



Damage caused by partial loss of Oil Filler Door



Pre-mod showing Refuel Filler Door not fully closed leading to scooping effect

Since issuance of **SB A320-71-1061**, it was determined that incorrect rigging may have been accomplished during production on limited batch on post mod oil servicing doors, which could impair effectiveness of **SB A320-71-1061**. Goodrich Aerostructures issued **VSB V2500-NAC-71-0332** providing instructions for inspecting and rigging of affected doors.

#### > Other references

- TFU 71.13.00.059 – V2500 Fan Cowl Oil Filler Door Loss
- EASA SIB 2016-01R1 – Improved Oil Filler Door Latches on IAE V2500 Engines
- Goodrich Aerostructures **VSB V2500-NAC-71-0332**
- ISI 00.00.00184 – Part Departing from Aircraft – Available solutions avoiding event

## Introduce SCN23 Engine Electronic Controller (EEC) Software standard for IAE V2500-A5 Engines

### Engine stall prevention at low altitude

ATA 73

A320 family A/C with IAE V2500-A5 Engines

No OEB

#### > Description of safety topic

AIRBUS has received reports of aircraft that experienced unexpected engine stall during descent, Starter Air Valve (SAV) nuisance fault and igniter durability issues affecting the engines IAE V2500-A5.

#### > Available enhancements

The new EEC software standard SCN23 includes the following main enhancements:

- Descent stall mitigation by improving the logics of the 7A engine stability bleed valve closure;
- Fix SAV nuisance fault message;
- Improve igniter durability;
- Approach idle phase.

The new EEC software standard SCN23 can be embodied via **SB A320-73-1138**.

#### > Other references

- FOT 999.0094/18
- TFU 71.00.00.118
- IAE SB 73-0248

## Electronic Engine Control EEC Standard 7.0

### UPDATED

Safety Beyond  
Standard

#### Prevention of In-Flight Shut Down events Oil leak detection improvement

ATA 73

A320neo family A/C fitted with PW1100 Engines

No OEB

##### > Description of safety topic

Engine starting issues such as ATS turning in flight due to SAV partially open in flight and starter failure, as well as associated damage to the starter duct have been reported in-service, in some cases leading to IFSD.

Standard 7.0:

Several engines have been removed due to ENG HIGH VIBRATION considered as not transient.

##### > Available enhancements

Software standard 6.2 and 6.3 includes new logics to address this issues as well as oil leak detection improvements:

- **SB A320-73-1146;**
- **SB A320-73-1150.**

Software standard 7.0 includes enhancement to inhibit the ENG 1(2) HIGH VIBRATION ECAM alert in defined conditions of N2 transient vibrations:

- P&W **VSB 73-00-0054;**
- **SB A320-73-1154.**

##### > Other references

- TFU 80.00.00015
- TFU 73.21.00028
- TFU 75.24.00001
- TFU 73.21.00034

## Introduction of new ECU Software (FADEC 5BT)

#### Engine uncommanded rotation prevention Engine stall at thrust reduction prevention

ATA 73

A320 family A/C fitted with CFM56-5B engines

Cancel  
OEB 35

##### > Description of safety topic

New ECU logic is available that:

- Improves behavior against engine stall at thrust reduction;
- Prevents engine uncommanded rotation at engine start.

##### > Available enhancements

ECU software 5BT:

- **SB A320-73-1103** "FADEC SYSTEM – Introduce ECU software "5BTF3" on CFM56-5B ENGINES".

##### > Additional benefits

For aircraft pre ECU software 5BR, installation of 5BT cancels OEB35.

##### > Other references

- TFU 80.00.00.017 A320 FAM – CFM56-5B – Uncommanded Engine Rotation
- ISI 73.20.00004 – A320 Fam CFM56-5B ENGINE – ECU/FADEC standard combination – Intermix

## Oil Leak at LP35 adapter fitting

### UPDATED

#### Prevention of In-Flight Shut Down events

ATA 79

A320neo family A/C fitted with PW1100 Engines

No OEB

#### > Description of safety topic

Rapid oil quantity decrease and loss of oil pressure reported in-flight with ENG 1(2) OIL LO PR ECAM Alert. On ground, oil leaks observed at the LP35 interface.

#### > Available enhancements

Mitigations available:

- **PW VSB 79-00-0033** apply oil and high torque at 1000 hours of SB release, or at first maintenance opportunity for all engines;
- **PW VSB 79-00-0034** repetitive inspection and torque check at and every 1000 cycles.

#### > Other references

OIT 999.0055/21

## Modification of pylon fire bottle electrical harness installation

#### Prevention of undetected loss of engine fire extinguishing capability

ATA 92

A320 family A/C

No OEB

#### > Description of safety topic

Cases of chafing on fire bottle 1 cartridge power supply harness, located in the pylon primary structure have been reported.

#### > Available enhancements

This Service Bulletin replaces the convoluted conduit and associated clamps installed on pylon fire power harness by an open split textile conduit.

- **SB A320-92-1117**



# Safety functions

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## AP/FD TCAS

### UPDATED

#### Enhance crew response to TCAS alerts

Safety  
Function

A320 family A/C

##### > Description of safety topic

Surprise and stress induced by TCAS Resolution Advisories (RA) may lead to nonoptimum crew response, resulting in undue aircraft altitude deviations, injuries in the cabin, lack of proper communication with Air Traffic Control (ATC).

##### > Available enhancements

With the Auto Pilot (AP) engaged, the AP/FD TCAS function flies the TCAS RA maneuver automatically. With the AP disengaged, the function provides guidance for manual flying through the Flight Director (FD). For AP/FD TCAS activation, contact your Product Sales focal point or Customer Support Director to trigger RFC/RMO process.

The TCAS Alert Prevention (TCAP), a new altitude capture enhancement to minimize cases of TCAS level-off RAs. (With FG standard PI17 or PC20 and subsequent).

##### > Aircraft prerequisites

Prerequisite SB list dependant on your aircraft configuration. Refer to function activation SB for details.

##### > Other references

- Article in Safety First #33

##### > Contacts

Contact your Product Sales focal point or Customer Support Director to trigger RFC/RMO process to be included in the SB effectivity.

## Braking Action Computation Function (BACF)

### UPDATED

#### Runway overrun prevention

Safety  
Function

A320 family A/C

##### > Description of safety topic

Inaccurate knowledge of runway condition may lead to runway overrun.

##### > Available enhancements

This enhancement computes, displays and broadcasts A/C braking action just after landing to improve runway condition awareness.

This enhancement is compliant with the Global Reporting Format mandatory on November 2020.

The following SB install the BACF software:

- **A320-46-1170** BACF V4 for CEO aircraft pre-FANS/FANS A+, FANS B and FANS C;
- **A320-46-1171** BACF V4 for NEO aircraft pre-FANS/FANS A+, FANS B and FANS C.

##### > Additional benefits

ATSU Software standard:

- FANSC minimum CSB9;
- FANS B+ minimum CSB6; or
- Pre-FANS minimum CSB7.2; or
- FANS A+ minimum CSB7.4.

ATSU hardware standard:

- C40 (Pre-FANS only); or
- C50 (Pre-FANS only); or
- C70 (Pre-FANS only); or
- A10 (Pre-FANS, FANS A+ or FANS B+ only).

Refer to prerequisite table for FWC, SDAC and DMC requirements.

##### > Other references

- 24th Flight Safety Conference: Descent, Approach & Landing Energy Management Design Enhancements presentation
- Article in Safety first N°26

##### > Contacts

Software provided free of charge upon the signature of agreement with Navblue.

For more information contact Navblue ([runwaysense@navblue.aero](mailto:runwaysense@navblue.aero)).

## SBAS Landing System (SLS)

### NEW

**Enhanced guidance for approaches**  
**Enhanced situational awareness**  
**Prevention of CFIT / runway undershoot**

Safety  
Function

A320 family A/C fitted with EIS2 and FMGC 3G

#### > Description of safety topic

The majority of CFIT / undershoot accidents have occurred during a Non Precision Approach. Various contributing factors were identified. Among these, one of the most common is a loss of situational awareness (lateral and/or vertical). SLS is the function developed to fly LPV approaches (under SBAS coverage) with guidance cues that provides an enhanced situation awareness (lateral and vertical).

#### > Available enhancements

SLS allows conducting RNAV (GNSS) approaches with similar display guidance and alerts as ILS precision approaches (ILS look alike).

GPS augmentation is based on geostationary satellite, without the need for ground equipment SLS provides performance equivalent to CAT I ILS: down to 200 ft.

Benefits: ILS look alike, Harmonised way to fly all approaches, Reducing the crew workload in approach.

#### > Aircraft prerequisites

Activation of the SLS is done by modification of the FMS OPC software

FMGC 3G standard H4PC20 or H4PI17

EIS2 standard S17

MMR Collins Aerospace GLU2100 or Honeywell IMMR L2

The function has also a minimum level of equipment for ISIS, FWS, FDIMU, TAWS, HUD (when installed)

#### > Contacts

Contact your Product Sales focal point or Customer Support Director to trigger RFC/RMO process to be included in the SB effectivity.

## FMS Landing System & FLS and FINAL APP (RNP AR) coexistence

### NEW

**Enhanced vertical guidance for straight-in non precision approaches**  
**Enhanced situational awareness**  
**Prevention of CFIT / runway undershoot**

Safety  
Function

A320 family A/C

#### > Description of safety topic

The majority of CFIT / undershoot accidents have occurred during a Non Precision Approach. Various contributing factors were identified. Among these, one of the most common is a loss of situational awareness (lateral and/or vertical). FLS is the function developed to fly Non Precision Approaches (when straight-in) with guidance cues that provides an enhanced situation awareness (lateral and vertical).

#### > Available enhancements

**FMS Landing System (FLS)** enables the pilot to fly a published straight-in Non-Precision Approach (NPA) in the same manner as a precision approach.

The aircraft is guided along a “virtual” beam composed from an anchor point, a course and a slope; corrected from temperature below ISA.

Benefits: ILS look alike; Harmonised way to fly all approaches; Reducing the workload in approach;

Angular vertical guidance with low T° compensation; Easing the beam capture; Enhancing crew awareness (e.g. virtual LOC beam displayed on ND).

FLS and FINAL APP can coexist when FMS Release 2 standard is installed (H3 or S8 and subsequents). FLS is the approach mode activated by default however FINAL APP is automatically selected when an RNAV RNP AR approach is selected or when the Approach geometry is not compatible with FLS.

Note: FLS function is addressing the FINAL APP mode limitations: e.g. Restricted capture conditions, not flexible with ATC constraints (vectoring), no T° compensation for cold weather, no vertical guidance for LOC only.

#### > Aircraft prerequisites

Activation of the FLS and Final APP (RNP AR) coexistence is done by modification of the FMS OPC software. The FLS function requires a minimum level of equipment for FMGC, EIS, MMR, DFDR, FWC, TAWS, FCU, CFDIU.

#### > Contacts

Contact your Product Sales focal point or Customer Support Director to trigger RFC/RMO process to be included in the SB effectivity.



# Runway Overrun Prevention System (ROPS)

## UPDATED

### Runway overrun prevention

### Safety Function

#### A320 family A/C

#### > Description of safety topic

Accident and hull losses statistics show that runway excursion remains a significant safety issue.

#### > Available enhancements

ROPS provides alerts to the flight crew when a high risk of runway overrun is detected during air phase (Go Around) and ground phase (Max braking Max Thrust Reverser). The following enhancements have been introduced with ROPS Step 2:

- Undue ROP alerts at low speed near runway end corrected with FAC CAA03 & B624.
- Undue ROW/ROP alert due to Long Flare logic corrected with FAC CAA09 & B625.
- Undue ROP alerts at high speed (DRY RWY) corrected with FAC CAA09 & B625.

For ROPS activation, contact your Product Sales focal point or Customer Support Director to trigger RFC/RMO process.

The following enhancements have been introduced with ROPS Step 2+:

- Update the ROP algorithm to enhance performance monitoring and improve alert accuracy during the deceleration;
- Install a dedicated rotary switch on the cockpit panel to select between wet or dry runway condition. The runway status selected is displayed in the navigation display;
- Introduce a dedicated inhibition P/B located in the overhead panel.

For ROPS step 2+ activation on aircraft already fitted with step 2: SB availability on request.

#### > Aircraft prerequisites

Refer to prerequisite table.

**Note for ROPS Step 2+:** the ROPS OFF installation is a prerequisite to the installation of the DRY/WET selector.

#### > Other references

- Article in Safety first N°08
- 24th Flight Safety Conference: Descent, Approach & Landing Energy Management Design Enhancements presentation
- Tfu 22.00.00.071 Activate ROPS Function
- Tfu 22.00.00098 Install and activate ROPS Step 2+ capability including runway condition selection

#### > Contacts

Contact your Product Sales focal point or Customer Support Director to trigger RFC/RMO process to be included in the SB effectivity.





## Abbreviations

<b>ADM</b>	Air Data Module	<b>IFTB</b>	In Flight Turn Back
<b>ADR</b>	Air Data Reference	<b>IFSD</b>	In-Flight Shut Down
<b>ADIRS</b>	Air Data Inertial Reference System	<b>ILS</b>	Instrument Landing System
<b>ADIRU</b>	Air Data Inertial Reference Unit	<b>ISI</b>	In-Service Information
<b>AEVS</b>	Avionics Equipment Ventilation System		
<b>AFS</b>	Automatic Flight System	<b>LGCIU</b>	Landing Gear Control and Interface Unit
<b>AMU</b>	Audio Management Unit	<b>LOC</b>	Air Data Localizer
<b>AOA</b>	Angle Of Attack		
<b>A/P</b>	Autopilot	<b>MLG</b>	Main Landing Gear
<b>A/THR</b>	Autothrust	<b>MDA</b>	Minimum Descent Altitude
<b>ATC/XPDR</b>	Air Traffic Control Transponder	<b>MDH</b>	Minimum Descent Height
<b>ATSU</b>	Air Traffic Service Unit	<b>MMR</b>	Multi Mode Receiver
<b>BUSS</b>	Back Up Speed Scale	<b>OEB</b>	Operations Engineering Bulletin
		<b>OFV</b>	OutFlow Valve
<b>CPCS</b>	Cabin Pressure Control System	<b>OHDS</b>	Over Heat Detection System
<b>CPC</b>	Cabin Pressure Controller	<b>OIT</b>	Operator Information Transmission
<b>DL</b>	Data Loading	<b>PA</b>	Passenger Address
<b>DMC</b>	Display Management Computer	<b>PFD</b>	Primary Flight Display
		<b>PN</b>	Part Number
<b>ECS</b>	Environmental Control System	<b>PTU</b>	Power Transfer Unit
<b>ECU</b>	Electronic Control Unit		
<b>EEC</b>	Engine Electronic Computer	<b>RFC/RMO</b>	Request For Change/Retrofit Modification Order
<b>EGT</b>	Exhaust Gas Temperature	<b>RIL</b>	Retrofit Information Letter
<b>EIS</b>	Electronic Instrument System	<b>RNP</b>	Required Navigation Performance
<b>ELAC</b>	Elevator Aileron Computer	<b>ROW</b>	Runway and Overrun Warning
<b>EM2</b>	Enhanced Manufacturing and Maintainability	<b>ROPS</b>	Runway Overrun Prevention System
<b>EWD</b>	Engine Warning Display		
		<b>SB</b>	Airbus Service Bulletin
<b>FAV</b>	Fan Air Valve	<b>SBS</b>	Safety Beyond Standard
<b>FCDC</b>	Flight Control Data Concentrator	<b>SDAC</b>	System Data Acquisition Concentrator
<b>FCU</b>	Flight Control Unit	<b>SEC</b>	Spoiler Elevator Computer
<b>FD</b>	Flight Director		
<b>FLSCU</b>	Fuel Level Sensing Control Unit	<b>TAT</b>	Total Air Temperature
<b>FMA</b>	Flight Mode Annunciator	<b>TCAS</b>	Traffic alert and Collision Avoidance System
<b>FMGC</b>	Flight Management and Guidance Computer	<b>TCAP</b>	TCAS Alert Prevention
<b>FMS</b>	Flight Management System	<b>TCT</b>	Temp Control Thermostat
<b>FOT</b>	Flight Operations Transmission	<b>THS</b>	Trimmable Horizontal Stabilizer
<b>FPA</b>	Flight Path Angle	<b>TFU</b>	Technical Follow Up
<b>FQIC</b>	Fuel Quantity Indication Computer	<b>TLT</b>	Temp Limitation Thermostat
<b>FWC</b>	Flight Warning Computer	<b>TOS</b>	Take-Off Securing
<b>GCU</b>	Generator Control Unit	<b>UAMM</b>	Unreliable Airspeed Mitigation Means
<b>GPSSU</b>	Global Positioning Sensor System Unit		
<b>GS</b>	Glide Slope	<b>VSB</b>	Vendor Service Bulletin
<b>HPC</b>	High Pressure Compressor	<b>XPDR</b>	Transponder
<b>HPV</b>	High Pressure Valve		
<b>HSP</b>	High Speed Protection		



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# AIRBUS

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