



# Notice of Proposed Amendment 2016-17

## Regular update of certification specifications for standard changes & standard repairs (CS-STAN)

RMT.0690 ISSUE 1 — 7.12.2016

### EXECUTIVE SUMMARY

This Notice of Proposed Amendment (NPA) is based on the ‘systematic rulemaking projects’ concept introduced into the European Aviation Safety Agency’s Management Board Decision replacing Decision 01/2012 on the ‘Rulemaking Procedure’ (EASA MB Decision 18-2015 of 15 December 2015). This concept aims at improving the efficiency of the EASA rulemaking process.

The specific objective of this NPA is to propose amendments to CS-STAN taking into account the principles of efficiency and proportionality.

The ultimate goal is to support the operation of the affected aircraft in Europe, reducing the regulatory burden for the embodiment of simple changes and repairs in certain aircraft when fulfilling the acceptable methods, and promoting safety.

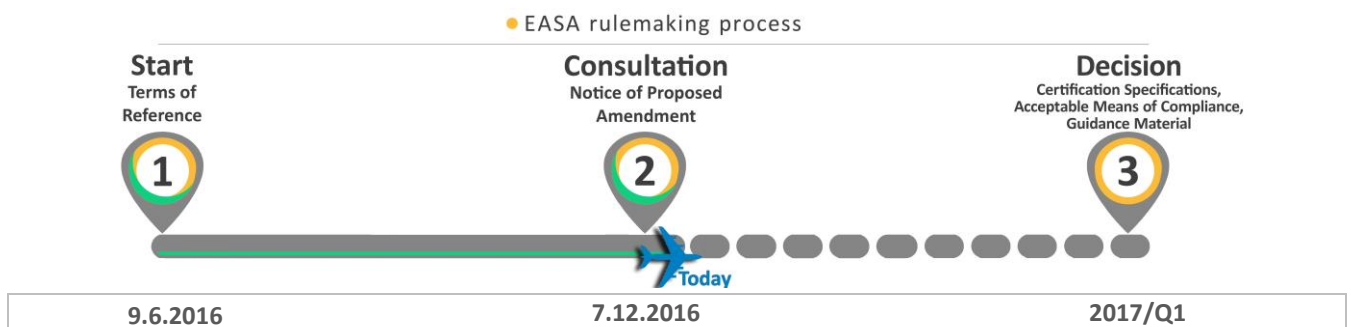
This NPA proposes to:

- provide additional explanations on the use of CS-STAN;
- introduce new standard changes and update some existing ones; and
- introduce new standard repairs and update some existing ones

The changes introduced by this NPA are based on lessons learnt and proposals submitted by affected stakeholders, as well as technological innovations from the industry, which can bring safety benefits in a cost-efficient manner.

Overall, this would bring a moderate safety benefit, would have no social or environmental impacts, and may provide major economic benefits by reducing the regulatory burden for the embodiment of simple changes and repairs in certain aircraft when fulfilling the acceptable methods, techniques and practices included in CS-STAN.

<b>Action area:</b>	General Aviation		
<b>Affected rules:</b>	CS-STAN		
<b>Affected stakeholders:</b>	Operators other than airlines, MOs, and maintenance engineers or mechanics		
<b>Driver:</b>	Efficiency/Proportionality	<b>Reference:</b>	N/A
<b>Rulemaking group:</b>	No	<b>Impact assessment:</b>	None
		<b>Procedure:</b>	Standard



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## 1. Procedural information

### 1.1. The rule development procedure

The European Aviation Safety Agency (EASA) developed this Notice of Proposed Amendment (NPA) in line with Regulation (EC) No 216/2008<sup>1</sup> (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure<sup>2</sup>.

This rulemaking activity is included in the EASA [5-year Rulemaking Programme](#) under RMT.0690.

The text of this NPA has been developed by EASA. It is hereby submitted for consultation of all interested parties<sup>3</sup>.

### 1.2. The structure of this NPA and related documents

Chapter 1 of this NPA contains the procedural information related to this task.

Chapter 2 (Explanatory Note) explains the core technical contents.

Chapter 3 contains the proposed text for the amendment of CS-STAN.

This NPA does not require a RIA.

### 1.3. How to comment on this NPA

Please submit your comments using the automated **Comment-Response Tool (CRT)** available at <http://hub.easa.europa.eu/crt/><sup>4</sup>.

The deadline for submission of comments is **7 February 2017**.

### 1.4. The next steps

Following the closing of the NPA public consultation period, EASA will review all comments. The outcome of this consultation will be reflected in a comment-response document (CRD) which EASA will publish concurrently with the decision. Based on the outcome of the NPA public consultation, the decision will contain the amendments to CS-STAN in a consolidated document.

<sup>1</sup> Regulation (EC) No 216/2008 of the European Parliament and the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1).

<sup>2</sup> EASA is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See EASA Management Board (MB) Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material ('Rulemaking Procedure').

<sup>3</sup> In accordance with Article 52 of the Basic Regulation and Articles 5(3) and 6 of the Rulemaking Procedure.

<sup>4</sup> In case of technical problems, please contact the CRT webmaster ([crt@easa.europa.eu](mailto:crt@easa.europa.eu)).



## 2. Explanatory Note

### 2.1. Overview of the issues to be addressed

The initial issue of CS-STAN was adopted on 8 July 2015 and contained only a limited amount of standard changes and standard repairs (SCs/SRs).

The development of CS-STAN, including its regular update, is part of the EASA strategy to support General Aviation (GA).

EASA is proposing in this NPA certification specifications (CS) with new or amended standard changes and standard repairs, as defined in 21.A.90B and 21.A.431B of Annex I (Part-21) to Regulation (EU) No 748/2012. This Notice of Proposed Amendment (NPA) is based on the 'systematic rulemaking projects' concept introduced into the European Aviation Safety Agency's Management Board Decision replacing Decision 01/2012 on the 'Rulemaking Procedure' (EASA MB Decision No 18-2015 of 15 December 2015). This concept aims at improving the efficiency of the EASA rulemaking process.

A considerable amount of proposals for amendments to CS-STAN have been submitted by stakeholders during the consultation of NPA 2014-24 'CS-STAN — Phase 1' and later on through rulemaking proposals<sup>5</sup> and other channels (e.g. GA Road Map, emails).

EASA assessed all these proposals taking into account the principles of efficiency and proportionality as well as safety impacts and selected those eligible for inclusion in CS-STAN Issue 2.

The ultimate goal is to support the operation of GA aircraft in Europe, reducing the regulatory burden for the embodiment of simple changes and repairs in certain aircraft when fulfilling the acceptable methods and promoting means to improve safety.

### 2.2. Objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 2 of this NPA.

The specific objective of this NPA is to propose amendments to CS-STAN based on the selection of non-complex, non-controversial and mature subjects, with the ultimate goal to support General Aviation in Europe and to promote safety.

### 2.3. Summary of the Regulatory Impact Assessment (RIA)

There is no need to develop a RIA, in accordance with EASA MB Decision No 18-2015, as this NPA has been prepared in the framework of regular update of CS-STAN.

<sup>5</sup> <https://www.easa.europa.eu/document-library/rulemaking-programmes/rulemaking-proposal>



## 2.4. Overview of the proposed amendments

The new and updated certification specifications proposed with this NPA contain acceptable methods, techniques, and practices for carrying out and identifying standard changes and standard repairs for embodiment in certain aircraft without a design approval.

The most significant changes introduced by this NPA are listed hereafter:

### **LINK TO CS-STAN WEB PAGE**

A note providing a link to the CS-STAN webpage<sup>6</sup> will be added on the first page of the CS-STAN, right after the table of contents.

A form will be linked from this webpage to allow stakeholders to:

- a) submit proposals for new SC/SR;
- b) provide feedback to improve the existing SC/SR; and
- c) voluntarily report the utilization of CS-STAN for statistical purposes.

### **SUBPART A**

- The scope has been expanded to provide additional clarification regarding the release to service of aircraft modified or repaired according to CS-STAN
- Additional explanations have been provided to further clarify the operational limitations and restrictions for the use of SC/SR with regard to installation of equipment.
- Clarifications have been added regarding the prevention of conflict between SC/SR provisions and TC holder's data

### **SUBPART B**

#### **CS-SC002b — Installation of a Mode S elementary surveillance equipment (amended)**

This SC has been amended to clarify the reference to CS-ACNS Section 4 and to prevent possible misinterpretation.

#### **CS-SC032a — Installation of anti-collision lights (new)**

New provisions have been added to facilitate the installation of anti-collision lights for aircraft not originally certified with anti-collision lights. EASA expects that this could have a positive impact on the prevention of mid-air collision.

#### **CS-SC034a — Installation of cabin and cockpit conventional lights by LED-type lights (new)**

New provisions have been added to facilitate the installation or exchange of cabin and cockpit lights by LED-type lights.

#### **CS-SC033a — Exchange of existing battery by Lithium Iron Phosphate (LiFePO4) batteries (new)**

New provisions have been added for the replacement of conventional type batteries by LiFePO4 type batteries as storage in aircraft.

<sup>6</sup> The link will be provided together with the ED Decision for CS-STAN Issue 2.



- **CS-SC051b — Installation of ‘FLARM’ equipment (amended)**

This SC has been amended to include provisions for the exchange of already installed FLARM equipment.
- **CS-SC052b — Installation of VFR GNSS equipment/moving-map systems to enhance situational awareness (amended)**

The scope of this SC has been extended to include provisions for the exchange of already installed VFR GNSS equipment/moving-map systems.

The applicability of this SC has been partially aligned with the corresponding FAA Advisory Circular, AC 20-138D ‘Airworthiness Approval of Positioning and Navigation Systems’.
- **CS-SC057a — Installation of a GPS system to enhance situational awareness and to support VFR navigation (new)**

New provisions have been added to allow the installation of a GPS system intended to enhance situational awareness and to support VFR navigation.
- **CS-SC058a — Installation of traffic awareness beacon system (TABS) equipment (new)**

New provisions have been added to allow the installation of TABS devices which are intended for voluntary equipage on aircraft not required to carry a transponder or automatic dependent surveillance - broadcast (ADS-B) equipment. According to the provisions included in this SC, the equipment shall be authorised according to ETSO-2C199.

This ETSO will be published as part of CS-ETSO amendment 13 which is planned for 2017/Q3.
- **CS-SC081a — Exchange of tyres (inner tubes/outer tyres) (new)**

This SC is intended to allow replacement of tyres (i.e. the change of inner tubes and/or outer tyres) with a different tube/tyre of the same size and strength.
- **CS-SC082a — Exchange of skids on wing tips/fuselage tails (new)**

New provisions have been added to allow replacement of skids, typically made of rubber or other elastic material, installed on fuselage tails and/or wing tips.
- **CS-SC083a — Exchange of flexible seals on control surfaces (new)**

New provisions have been added to allow replacement of flexible seals as installed on control surfaces on wings and empennages.
- **CS-SC102a — Installation of DC power supply systems (PSS) for portable electronic devices (PED) (new)**

New provisions have been added to allow the Installation of DC power supply systems (PSS) which connect aeroplane electrical power to portable electronic devices (PED).
- **CS-SC103a — Exchange of interior material covering floor, sidewall and ceiling (new)**

New provisions have been added to allow the exchange of existing floor, sidewall, and ceiling coverings.
- **CS-SC104a — Installation of lightweight in-flight recording systems (new)**

New provisions have been added to allow the installation of lightweight in-flight recording systems for the purposes of operational monitoring, training, and incident analysis.
- **CS-SC202b — Use of aviation gasoline (AVGAS) UL 91 (amended)**

The scope of this SC has been amended to include guidance provided by the latest FAA Special Airworthiness Information Bulletin SAIB HQ-16-05R1.



- **CS-SC203b – Use of aviation gasoline (AVGAS) HJELMCO 91/96 UL AND 91/98 UL (amended)**

The scope of this SC has been amended to include guidance provided by the latest FAA Special Airworthiness Information Bulletin SAIB HQ-16-05R1.
- **CS-SC205a – Installation of fuel low level sensor (FLLS) (new)**

New provisions have been added to allow the installation of fuel low level sensors for aircraft not already equipped with similar system.

The installed fuel low level sensor will improve the situational awareness and should positive contribute on the prevention of fuel starvation occurrences.
- **CS-SC251b – Installation of an angle of attack (AoA) indicator system (amended)**

The scope of this SC has been amended to include alternative process to check the proper application of ASTM F3011-13 standard for the AoA to be installed.
- **CS-SC401b – Exchange of basic flight system instruments (amended)**

The scope of this SC has been amended to allow the exchange of certain combinations of different systems.
- **CS-SC403a – Provisions for the installation of lightweight cameras (new)**

New provisions have been added to allow the installation of aircraft mounted lightweight cameras.

### **SUBPART C**

- **CS-SR802b – Repair of sailplanes, powered sailplanes, LSA and VLA (amended)**

The scope of this SC has been amended to allow the utilization of an additional French standard for skin repairs.
- **CS-SR803a – Repairs of canopy cracks by drilling a stopping hole (new)**

New provisions have been added to allow the repairs of certain cracks in transparent canopy made from acrylic glass by drilling a stopping hole.
- **CS-SR804a – Use of epoxy resin for the repair of aircrafts build with wood (new)**

New provisions have been added to allow the use of epoxy resin system to perform certain repairs on wood and wooden mixed aircraft structures.

The main advantage of this process is that during the curing time no high contact pressure is necessary.



### 3. Proposed amendments

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

- deleted text is marked with ~~strike through~~;
- new or amended text is highlighted in grey;

an ellipsis (...) indicates that the remaining text is unchanged in front of or following the reflected amendment.

#### 3.1. Draft certification specifications (CSs) (Draft EASA Decision)

Amend the CS-STAN, as follows:

##### CONTENTS (general layout)

(...)

*NOTE: To support the identification of improvements to CS-STAN and support its future evolution, EASA would appreciate stakeholders' voluntary feedback through the EASA website<sup>7</sup>*

#### SUBPART A - GENERAL

##### CS STAN.00 Scope

These Certification Specifications for SCs/SRs contain design data with acceptable methods, techniques and practices for carrying out and identifying SCs/SRs. SCs/SRs, designed in compliance with these Certification Specifications, are not subject to an approval process, and, therefore, can be embodied in an aircraft when the conditions set out in the relevant paragraphs of Part-21<sup>8</sup> for SCs/SRs, i.e. 21.A.90B or 21.A.431B, are met.

Subpart B and Subpart C contain the list of standard changes and repairs permitted under 21.A.90B or 21.A.431B. Other changes/repairs not included in these subparts cannot be considered as SCs/SRs (e.g. CS-STAN cannot be used to install or exchange integrated avionic or navigation systems).

Acceptable means of compliance for the release to service of aircraft modified or repaired through embodiment of SCs or SRs are detailed in AMC.M.A.801. Additional limitations are introduced for certain SCs/SRs depending on their complexity for example the 'pilot owner' is often not allowed to release the aircraft into service.

##### CS STAN.20 Operational Limitations or restrictions

SCs/SRs, as described in these Certification Specifications, may contain operational limitations or restrictions with regard to the use of an aircraft instrument/equipment.

<sup>7</sup> The link will be provided together with the ED Decision for CS-STAN Issue 2.

<sup>8</sup> Annex of Commission Regulation (EU) No 748/2012 of 3 August 2012 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations and repealing Commission Regulation (EC) No 1702/2003 (OJ L 243, 27.9.2003, p.6).





Equipment installed as part of an SC cannot be used to eliminate or reduce the existing airworthiness limitations and operational limitations of the aircraft (e.g. an aircraft certified for VFR operation cannot be authorised to operate IFR as a result of modifications embodied through CS-STAN).

As a consequence, an SC might introduce limitations on the use of the installed equipment (e.g. a navigation equipment may be installed following an SC, but this installation may not permit that the equipment is used as a primary navigation means if the functionality did not exist before the change was embodied).

Any restriction or limitation applicable due to the embodiment of the SC/SR is included in the aircraft manuals or records, as necessary, and in EASA Form 123.

### **CS STAN.30 Changes/Repairs that are not in conflict with TC holders' data**

Each SC/SR has an applicability independent of the aircraft type and can be embodied in/on an aircraft type unless the SC/SR is in conflict with any information or limitation given by the TC holder as part of the approved aircraft flight manual (AFM), or the approved sections of the instructions for continued airworthiness (ICA).

Information mandated by an airworthiness directive (AD), cannot be contradicted by means of a SC or SR. specific instructions for such a change or repair are issued by the TC holder.

~~In case that specific data issued by the TC holder exist the TC holder data takes precedence over a SC/SR.~~

~~If the change or repair would conflict with the TC holder data, CS-STAN should not be followed and the change/repair should be approved following Part 21 Subparts D or M.~~

### **CS STAN.80 Definitions and Abbreviations**

(...)

'ADS-B' means automatic dependent surveillance - broadcast

'AoA' means angle of attack

'DC-PSS' means direct current power supply system

'FAA' means Federal Aviation Administration

'FLARM' means flight and alarm

'GNSS' means global navigation satellite system

'GPS' means global positioning system

'ISA' means international standard atmosphere

'LED' means light-emitting diode

'LSA' means light sport aeroplane

'MEL' means minimum equipment list

'PED' means portable electronic device

'TABS' means traffic awareness beacon system

'TAS' means traffic advisory system



'TCAS' means traffic alert and collision avoidance system

'VLA' means very light aeroplane

(...)



**SUBPART B — STANDARD CHANGES****LIST OF STANDARD CHANGES**

## Group Systems — Communication:

- CS-SC001a — Installation of VHF voice communication equipment
- CS-SC002a**b** — Installation of a Mode S elementary surveillance equipment
- CS-SC003a — Installation of Audio Selector Panels and Amplifiers
- CS-SC004a — Installation of antennas

## Group Systems — Electrical:

- CS-SC031a — Exchange of conventional Anti-Collision Lights, Position Lights and Landing & Taxi lights by LED-type lights
- CS-SC032a — Installation of anti-collision lights
- CS-SC033a — Installation of cabin and cockpit conventional lights by LED-type lights
- CS-SC034a — Exchange of existing battery by Lithium Iron Phosphate (LiFePO4) batteries

## Group Systems — Avionics/NAV/Instruments:

- CS-SC051a **b** — Installation of 'FLARM' equipment
- CS-SC052a **b** — Installation of VFR GNSS equipment/moving-map systems to enhance situational awareness
- CS-SC053a — Installation of Radio Marker Receiving equipment
- CS-SC054a — Exchange of Distance Measurement Equipment (DME)
- CS-SC055a — Exchange of ADF equipment
- CS-SC056a — Exchange of VOR equipment
- SC-SC057a — Installation of a GPS system to enhance situational awareness and to support VFR navigation
- SC-CS058a — Installation of traffic awareness beacon system (TABS) equipment

## Group Systems — Hydro-mechanical :

- CS-SC081a — Exchange of tyres (inner tubes/outer tyres)
- CS-SC082a — Exchange of skids on wing tips/fuselage tails
- CS-SC083a — Exchange of flexible seals on control surfaces

## Group Cabin:

- CS-SC101a — Installation of Emergency Locator Transmitter (ELT) equipment
- CS-SC102a — Installation of DC power supply systems (PSS) for portable electronic devices (PED)



CS-SC103a — Exchange of interior material covering floor, sidewall and ceiling

CS-SC104a — Installation of lightweight in-flight recording systems

Group Survivability Equipment:

CS-SC151a — Installation of headrest

CS-SC152a — Changes to seat cushions including the use of alternative foam materials

CS-SC153a — Exchange of safety belts — torso restraint systems

Group Powerplant:

CS-SC201a — Exchange of power plant instruments

CS-SC202a b — Use of Avgas UL 91

CS-SC203a b — Use of Avgas Hjelmcø 91/96 UL and 91/98 UL

CS-SC204a — Installation of external powered engine preheater

CS-SC205a — Installation of fuel low level sensor (FLLS)

Group Flight:

CS-SC251a b — Installation of an angle of attack (AoA) indicator system

Group Miscellaneous:

CS-SC401a b — Exchange of basic flight instruments

CS-SC402a — Installation of sailplane equipment

CS-SC403a — Provisions for the installation of lightweight cameras



## Standard Change CS-SC002ab

### INSTALLATION OF MODE S ELEMENTARY SURVEILLANCE EQUIPMENT

#### 1. Purpose

Installation or exchange of Mode S transponder including, optionally, an altitude encoder exchange. This SC does not include installation of antennas.

This SC does not satisfy requirements set by cover CS-ACNS Subpart D Section 4 1090 MHz Extended Squitter (ES) ADS-B Out installations compliant to Section 4 of CS-ACNS or nor AMC 20-24.

#### 2. Applicability/Eligibility

Aeroplanes not being complex motor-powered aircraft with a maximum cruising speed in International Standard Atmosphere (ISA) conditions below 250 kts, rotorcraft not being complex motor-powered aircraft and any ELA2 aircraft.

#### 3. Acceptable methods, techniques and practices

The following standards contain acceptable data:

- FAA Advisory Circular AC 43-13-2B , Chapter 2.

Additionally, the following applies:

- The transponder equipment and its installation are in compliance with paragraph CS ACNS.D.ELS.010 of CS-ACNS and the altitude encoder meets ETSO C-88A or equivalent.
- The elementary surveillance system provides data according to CS ACNS.D.ELS.015.
- This SC does not comply with cover 1090 MHz Extended Squitter (ES) ADS-B Out installations compliant to Section 4 of CS-ACNS or AMC 20-24 . However, the voluntary transmission of additional ADS-B data (e.g. GPS position and velocity) can be accepted when the position and velocity quality indicators report lowest quality, the equipment manufacturer has stated compatibility with the directly connected GPS source, and the transponder is not authorised according to ETSO C166b or equivalent.
- If automatic determination of the on-the-ground status is not available, the on-the-ground status is set to 'airborne'.
- The reported pressure altitude is obtained from an approved source connected to the static pressure system providing pressure to the instrument used to control the aircraft.
- Any antenna connected to the transponder has a resulting pattern which is vertically polarised, omnidirectional in the horizontal plane and has sufficient vertical beam width to ensure proper system operation during normal aircraft manoeuvres.
- The equipment is qualified for the environmental conditions to be expected during normal operation.
- Instructions from equipment manufacturer have to be followed.
- A system ground test verifying all transmitted data according to ACNS.D.ELS.015 has to be performed.

#### 4. Limitations

Any limitations defined by the equipment manufacturer apply.



In the case of rotorcraft approved for NVIS, if cockpit panels are to be inserted, the change cannot be considered an SC.

#### 5. Manuals

Amend AFM with AFMS containing or referencing the equipment instructions for operation, as required.

Amend the Instructions for Continuing continued Airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required. In particular, include a check every two years to ensure that the data provided according to CS-ACNS ACNS.A.GEN.010 is correct.

#### 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC032a****INSTALLATION OF ANTI-COLLISION LIGHTS****1. Purpose**

This SC covers new anti-collision lights installations for aircraft not originally certified with anti-collision lights. Exchange of anti-collision lights is not covered by this SC.

**2. Applicability/Eligibility**

ELA2 aeroplanes, sailplanes or powered sailplanes that have been certified as VFR and they were not originally certified with anti-collision lights (this includes LSA, VLA and FAR 23 prior to Amendment 23-49 airplanes).

**3. Acceptable methods, techniques and practices**

Acceptable data addressing structural impact are gathered in paragraphs 3.1 and 3.2 as follows:

**3.1 Anti-collision lights installed on wing tips and/or vertical tail tip**

- FAA Advisory Circular AC 43.13-1B and AC 43.13-2B, Chapter 1 & 4; and
- FAA Advisory Circular AC 43.13-1B Chapter 11
- FAA Advisory Circular AC 20-30B

Additionally, the following applies:

- The equipment is authorised in accordance with ETSO-C96a or later amendments, or equivalent; otherwise the equipment shall comply with CS 23.1401(b) through (f) requirements;
- Anti-collision lights may be installed if their total weight including reinforcements is equal or lower than a certified anti-collision lights installation on a similar aeroplane. Similarity shall be assessed following the guidelines given by AC 23.629-1B Chapter 1, paragraph 1c. Anti-collision lights location shall be similar to the equivalent aeroplane. This assessment shall be recorded within the EASA Form 123.
- The anti-collision light is located in a distance to other systems appropriate for the aircraft and the anti-collision light.
- The anti-collision light is compatible with the connected equipment and is suitable for the environmental conditions to be expected during normal operation.
- Instructions and tests defined by the equipment manufacturer have to be followed and recorded.

Anti-collision lights installation shall not alter torsional stiffness.

**3.2 Anti-collision lights installed on fuselage**

- FAA Advisory Circular AC 43.13-1B and AC 43.13-2B, Chapter 1, 3, and 4;
- FAA Advisory Circular AC 43.13-1B Chapter 11; and
- FAA Advisory AC 20-30B.

Additionally, the following applies:

- The equipment is authorised in accordance with ETSO-C96a or later amendments, or equivalent; otherwise the equipment shall comply with CS 23.1401(b) through (f) requirements;



- The anti-collision light is installed in non-pressurised secondary structure areas, unless the location is set for this purpose in the airframe documentation or provided by the TC holder (i.e. NTO), or the anti-collision light is being installed on an existing provision with the same footprint.
- The anti-collision light is located in a distance to other systems appropriate for the aircraft and the anti-collision light.
- The anti-collision light is compatible with the connected equipment and is suitable for the environmental conditions to be expected during normal operation.
- Instructions and tests defined by the equipment manufacturer have to be followed and recorded.

#### 4. Limitations

- Any limitation defined by the equipment manufacturer applies.
- No installation of anti-collision lights on control surfaces is permitted.
- Only installation on wings without sweep angle is allowed.
- Installation of new anti-collision lights in high aspect ratio wings is not permitted unless the conditions of point 3.1 are met.

#### 5. Manuals

Amend AFM with AFMS containing or referencing the equipment instructions for operation, as required.

Amend the Instructions for Continued Airworthiness to establish maintenance actions/inspections and intervals, as required.

#### 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.





**Standard Change CS-SC033a****INSTALLATION OF CABIN AND COCKPIT CONVENTIONAL LIGHTS BY LED-TYPE LIGHTS****1. Purpose**

Installation or exchange of cabin and cockpit conventional lights by LED-type lights

**2. Applicability/Eligibility**

Aeroplanes not being complex motor-powered aircraft, rotorcraft not being complex motor-powered aircraft and not approved for NVIS and any ELA2 aircraft.

**3. Acceptable methods, techniques and practices**

The following standards contain acceptable data:

- FAA Advisory Circular AC 43.13-1B, Chapter 11, Section 15 (on bonding).

Additionally the following applies:

- if applicable, the equipment is authorised according to the applicable ETSO/JTSO or equivalent;
- any new installation or exchange of lights shall not interfere or degrade the existing emergency lights system;
- in case of exchange of conventional lights by LED lights, the equipment should be installed at the same location and with identical light distribution angles and colours, or at least
  - the new LED lights shall provide adequate lightning without introducing glare and/or reflections that could distract the flight crew or interfere with crew vision; and
  - for lights exchanged in the cockpit:
    - if warning, caution, or advisory lights are exchanged they must be:
      - red, for warning lights (lights indicating a hazard which may require immediate corrective action);
      - amber, for caution lights (lights indicating the possible need for future corrective action); and
      - green, for safe operation lights.
    - any other light exchanged in the cockpit must be of any other colour, including white, provided the colour differs sufficiently from the colours used for warnings, cautions, and advisories to avoid possible confusion;
- in case of installation of new LED lights, they shall provide adequate lightning without introducing glare and/or reflections that could distract the flight crew or interfere with crew vision; and:
  - if they are installed in the cockpit, they can be of any colour, provided the colour differs sufficiently from the colours used for warnings, cautions, and advisories to avoid possible confusion.
- the equipment is qualified for the environmental conditions to be expected during normal operation;
- instructions and tests defined by the equipment manufacturer have to be followed; and



- any modification of electrical wiring is performed in accordance with acceptable practices such as the aircraft maintenance manual or Chapter 11 of FAA Advisory Circular AC 43.13-1B.

#### **4. Limitations**

Any limitation defined by the equipment manufacturer applies.

#### **5. Manuals**

If needed, amend the AFM with AFMS containing equipment instructions for operation, as required.

Amend the instructions for continued airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required. In particular, consider description of required maintenance actions after failure of a single LED segment.

#### **6. Release to service**

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC034a****EXCHANGE OF EXISTING BATTERY BY LITHIUM IRON PHOSPHATE (LIFEPO<sub>4</sub>) BATTERIES****1. Purpose**

Exchange of conventional type batteries by LiFePO<sub>4</sub> type batteries in aircraft.

**2. Applicability/Eligibility**

Sailplanes and powered sailplanes.

This SC does not cover or replace applicable regulations for handling, storage, transport, and disposal of batteries. This SC does not cover the installation of a battery at a new location.

**3. Acceptable methods, techniques and practices**

— Acceptable standards for the battery or the battery cells test (performed by the manufacturer) are:

- RTCA DO-347, Certification Test Guidance for Small and Medium Sized Rechargeable Lithium Batteries and Battery Systems; or
- UL 1642, Standard for Lithium Batteries; or
- UL 2054, Standard for Household and Commercial Batteries.

— For installation purposes, the FAA Advisory Circular AC 43-13-2B, Chapters 1 and 2 is acceptable.

**4. Limitations**

— Batteries used for electrical or hybrid propulsion are not covered.

— Starter batteries are not covered

— The battery shall have an integrated battery management system.

— The battery shall have a maximum capacity of 100 Wh

— Any limitation defined by the battery manufacturer applies.

**5. Manuals**

Amend the instructions for continued airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required.

**6. Release to service**

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC051ab****INSTALLATION OF 'FLARM' EQUIPMENT**

*Note: Originally FLARM® was developed for sailplanes but nowadays such devices are more and more installed in light aeroplanes as well. While FLARM® devices are considered Standard Parts in case of sailplanes, 21.A.307(c) may allow their installation without Form 1.*

**1. Purpose**

Installation or exchange of FLARM® compatible Anti-Collision Awareness Systems. The system is based on the specifications as defined by FLARM Technology GmbH.

*Note: FLARM is not compatible with Transponder Mode A/C/S, ADS-B or TCAS/ACAS.*

The installation of external antennas or additional batteries is not covered by this SC.

**2. Applicability/Eligibility**

ELA2 aircraft.

**3. Acceptable methods, techniques and practices**

The following standards contain acceptable data:

- FAA Advisory Circular AC 43-13-2B, Chapters 1 and 2.
- FOCA policy 42-00.02: 'FLARM® and TR-DVS® Installation Policy for Aircraft, TMG, Helicopters, (Gliders)'

*Note: This Policy is applicable in principle for all installations, excluding the requirement that the device needs to be approved by FOCA.*

Additionally, the following applies:

- The design of the equipment installation must take into account crashworthiness, arrangement and visibility, interferences with other equipment, the canopy jettison and the emergency exit.
- The design of the equipment installation must take into account the structural integrity of the instrument panel or any other attachment point. Special consideration is necessary for equipment installed at a location behind the occupant(s).
- A data bus/data connectivity between the FLARM device and other equipment which is:
  - ETSO authorised (or equivalent); or
  - required by TCDS, AFM or POH;
  - required by other applicable requirements such as those for operations and airspace; or
  - mandated by the respective Minimum Equipment List (MEL), if this exist,is not allowed unless the FLARM device is explicitly listed by its manufacturer as compatible equipment to be connected to.
- The equipment is suitable for the environmental conditions to be expected during normal operation.
- Instructions and tests defined by the equipment manufacturer have to be followed.

**4. Limitations**

- The FLARM® based system cannot be used to substitute any Anti-Collision Device mandated by EASA OPS rules for the operation intended. The system is not to be used in conjunction with night vision systems or in night or IMC conditions.



- Any limitations defined by the manufacturer of the FLARM<sup>®</sup> device.

## 5. Manuals

The AFMS shall, at least, contain:

- the system description, operating modes and functionality;
- limitations, warnings and placards, at least, for the following:
  - 'For situational awareness only'
  - 'Use in VFR day only';
- the normal and emergency operating procedures; and
- instructions for software and database updates.

Amend the instructions for Continuing Airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required.

## 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC052a b****INSTALLATION OF VFR GNSS EQUIPMENT/MOVING-MAP SYSTEMS TO ENHANCE SITUATIONAL AWARENESS****1. Purpose**

Installation or exchange of a 'VFR GNSS equipment/moving-map' system to enhance situational awareness. This SC does not include installation of external antennas.

Note: The installation of an external antenna is addressed by CS-SC004.

**2. Applicability/Eligibility**

~~ELA2 aircraft.~~

Un-pressurised aircraft less than 2 721 kg (6 000 pounds) MTOM.

**3. Acceptable methods, techniques and practices**

The following standard contains acceptable data:

- FAA Advisory Circular AC 20-138D, including Change 1 and Change 2, Appendix 6, with the exception of paragraphs c and f.
- FAA Advisory Circular AC 43-13-2B, Chapter 1 and 2.

Additionally, the following applies:

- the design of the equipment installation must take into account crashworthiness, arrangement and visibility, and should not interfere with other equipment, the canopy jettison (if applicable), and the emergency exit;
- a data bus/data connectivity between with the installed equipment and other equipment which is:
  - ~~ETSO authorised (or equivalent), or~~
  - required by TCDS, AFM or POH,
  - required by other applicable requirements such as those for operations and airspace, or
  - mandated by the respective MEL, if this exists,

is not allowed unless the equipment being installed is explicitly listed by its manufacturer as compatible equipment to be connected to;

- the equipment is suitable for the environmental conditions to be expected during normal operation;
- ~~— the equipment is not used as primary means of navigation; and~~
- ~~— instructions and tests defined by the equipment manufacturer have to be followed.~~
- the equipment must be installed and tested in accordance with the equipment manufacturer's instructions.

**4. Limitations**

- The system is used for situational awareness under VFR day only.
- ~~— The system is not to be used in conjunction with night vision systems or in night or IMC conditions.~~
- ~~— The provided information is used only in an advisory or supplementary manner (no hazard, no credit basis).~~



- Any limitations defined by the equipment manufacturer apply.

## 5. Manuals

The AFMS shall, at least, contain:

- the system description, operating modes and functionality;
- limitations, warnings and placards, at least, stating for the following:
  - 'For situational awareness only', and
  - 'Use in VFR day only';
- the normal and emergency operating procedures; and

amend the maintenance manual with instructions for software and database updates.

Amend the instructions for Continuing continued Airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required.

## 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC057a****INSTALLATION OF A GPS SYSTEM TO ENHANCE SITUATIONAL AWARENESS AND TO SUPPORT VFR NAVIGATION****1. Purpose**

Installation of a GPS system intended to enhance situational awareness and to support VFR navigation. For integrated systems also providing a moving map and/or voice communications functionality and/or a VOR navigation capability CS-SC052/001/056 may be applied concurrently.

*Note: CS STAN.20 applies*

This SC does not cover the installation of external antennas (see CS-SC004, which may be applied concurrently). This SC does also not cover the connection of the GPS to any kind of autopilot as well as ADS-B OUT system.

**2. Applicability/Eligibility**

ELA2 aircraft, also valid if combined with other above mentioned SCs.

**3. Acceptable methods, techniques and practices**

The following standard contains acceptable data:

- FAA Advisory Circular AC 43-13-2B, Chapter 1 and 2.
- FAA Advisory Circular AC 20-138D, Change 2, Appendix 6.

Additionally, the following applies:

- The equipment to be installed must be authorised in accordance with one of the following EASA ETSO, or equivalent standards:
  - C-129(),
  - C-145(),
  - C-146(),
  - C-196().
- The equipment is suitable for the environmental conditions to be expected during normal operation;
- The design of the equipment installation must take into account crashworthiness, arrangement and visibility, interferences with other equipment, the canopy jettison (if applicable) and the emergency exit;
- Installation instructions and tests defined by the equipment manufacturer have to be followed;
- A data bus/data connectivity between the installed equipment and other equipment which is:
  - required by TCDS, AFM or POH or
  - required by other applicable requirements such as those for operations and airspace, or
  - mandated by the respective MEL, if this exists,

is not allowed unless the equipment being installed is explicitly listed by its manufacturer as compatible equipment to be connected to; and





- Placards with 'Not approved for primary navigation' and 'Advisory only' needs to be placed close to the installed equipment.

#### 4. Limitations

- All integrated databases (e.g. for charts) must be current;
- The equipment must not be used for IFR operations or as primary means of navigation for any other kind of operation;
- The provided information is to be used for advisory purposes only;
- The system is not to be used in conjunction with night vision systems (NVIS/NVG); and
- Any limitation defined by the equipment manufacturer applies.

#### 5. Manuals

The AFMS shall, at least, contain:

- the system description, operating modes and functionality;
- limitations, warnings and placards, at least, for the following:
  - 'Advisory, only';
  - 'Not for primary navigation';
- the normal and emergency operating procedures.

Amend the instructions for continued airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required, including instructions in case of software and database updates.

#### 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC058a****INSTALLATION OF TRAFFIC AWARENESS BEACON SYSTEM (TABS) EQUIPMENT****1. Purpose**

Installation of TRAFFIC AWARENESS BEACON SYSTEM (TABS). TABS devices are intended for voluntary equipage on aircraft not required to carry a transponder or automatic dependent surveillance - broadcast (ADS-B) equipment. TABS devices do not meet the transponder or ADS-B requirements defined in European Commission Implementing Regulations (EU) No 1206/2011 and (EU) No 1207/2011, therefore, this TABS installation is not sufficient to fly into transponder mandatory zones (TMZ).

The installation of a TABS will enable an aircraft to be visible to air navigation service providers and other aircraft equipped with:

- traffic advisory system (TAS);
- traffic alert and collision avoidance system I (TCAS I);
- traffic alert and collision avoidance system II, (TCAS II), and
- ADS-B IN capability.

**2. Applicability/Eligibility**

Aeroplanes not being complex motor-powered aircraft, rotorcraft not being complex motor-powered aircraft, and any ELA2 aircraft.

**3. Acceptable methods, techniques and practices**

The following standards contain acceptable data:

- FAA Advisory Circular AC 43-13-2B, Chapters 1 and 2.

Additionally, the following applies:

- The equipment is authorised according to ETSO-2C199<sup>9</sup>;
- The design of the equipment installation must take into account crashworthiness, arrangement and visibility, interferences with other equipment, the canopy jettison and the emergency exit;
- The design of the equipment installation must take into account the structural integrity of the instrument panel or any other attachment point. Special consideration is necessary for equipment installed at a location behind the occupant(s);
- A data bus/data connectivity between the TABS device and other equipment which is:
  - ETSO authorised (or equivalent); or
  - required by TCDS, AFM or POH; or
  - required by other applicable requirements such as those for operations and airspace; or
  - mandated by the respective minimum equipment list (MEL), if this exists,

<sup>9</sup> ETSO-2C199 will be published as part of CS-ETSO amendment 13.



is not allowed unless the TABS is explicitly listed by its manufacturer as compatible equipment to be connected to;

- The equipment is suitable for the environmental conditions to be expected during normal operation; and
- Instructions and tests defined by the equipment manufacturer have to be followed.

#### 4. Limitations

- Any limitation defined by the manufacturer of the TABS device.
- ADS-B IN information, if provided, is for situational awareness only.

#### 5. Manuals

The AFMS shall, at least, contain:

- the system description, operating modes and functionality;
- the normal and emergency operating procedures;
- limitations, warnings and placards, at least, for the following:
  - 'For situational awareness only';
- If the TABS provides ADS-B IN information, the AFMS must include a statement that the ADS-B IN data is to be used for situational awareness only.

Amend the instructions for continued airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required, including instructions in case of software and database updates.

#### 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC081a****EXCHANGE OF TYRES (INNER TUBES/OUTER TYRES)****1. Purpose**

This SC is intended to allow exchange of tyres (i.e. the change of inner tubes and/or outer tyres) with a different tube/tyre of the same size and strength.

**2. Applicability/Eligibility**

Sailplanes and powered sailplanes.

**3. Acceptable methods, techniques and practices**

Information by the aircraft manufacturer or STC holder needs to be observed to avoid damages to the wheel/brake system/landing gear installation.

Typically the change may only be performed by un-installing the regarding wheel and/or disassembly of the brake system.

Often the aircraft needs to be placed on jacks or the fuselage needs to be turned upside down (in case of disassembled sailplanes to allow such a disassembly. Information of the manufacturer or STC holder needs to be observed for the jacking or turning upside down.

As tyres increase in size with time, and a new tube may move in such a worn-out tyre, and an old tube may chafe in a new tyre more easily, it is recommended to always replace both the tyre and the tube at the same time.

Always observe the minimum strength (ply-rating) of the tyre/tube when changing tyres – when in doubt use at least the same or better ply-rating for the replacement tyre/tube.

Additionally, ensure that the tube has the proper size for the tyre.

After installation:

- bring the tyre/tube to the pressure according to the aircraft manufacturer or STC holder data
- check proper function of the brake system and landing gear retraction system when applicable
- check that the tyre has the required minimum space for turning freely.

Installation of a marking to later check for any movement between the tyre and the inner wheel (slip marker) is recommended.

**4. Limitations**

N/a.

**5. Manuals**

N/A

**6. Release to service**

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC082a****EXCHANGE OF SKIDS ON WING TIPS/FUSELAGE TAILS****1. Purpose**

This SC is intended to allow exchange of skids, typically made of rubber or other elastic material, installed on fuselage tails and/or wing tips. This may be required for installation of a different skid of comparable size and strength or exchange a rubber skid by a rubber skid with a small wheel.

**2. Applicability/Eligibility**

Sailplanes and powered sailplanes.

**3. Acceptable methods, techniques and practices**

Before exchange the old skid and any left-overs of the old bonded skid/glue needs to be removed.

Information by the aircraft manufacturer or STC holder needs to be observed to avoid damages to the skid or installation area.

Typically the installation is by gluing the rubber skid to the surface of the underside of the wing or fuselage tail.

The glue to be used may be of an industrial glue type (e.g. 'Pattex®') or an acrylic mounting glue (e.g. 'Sikaflex®').

Before performing the new glue bonding, clean all surfaces and prepare to press the new skid to the bonding joint during drying/polymerisation of the glue.

After bonding, it is recommended to seal the glue joint by means of a tape to prevent dirt or grass to enter into the glue joint.

If the aircraft manufacturer or STC holder requires a wire deflector to prevent capture of a winch wire at the glue joint of a tail skid then such a deflector needs to be installed – otherwise such a deflector (which could be a strong steel wire at the leading edge of the tail skid) is recommended.

When changing towards a rubber skid with small wheel, it is recommended to test the strength of the wheel by dropping the tail/wing tip from a height with the new installed skid which simulates the dropping of the tail or wing tip during a landing.

Use of this SC for installation of a skid which is installed by means of screws or bolts is permitted only for replacement by the same type of skid.

After installation, verify that the movement of the flight controls is not impaired by the new skids. The exchange is not allowed if the new skids do not have the proper size (i.e. the required movement of the control surfaces is more limited than with the old skids).

Additionally, a weight and balance report should show that the aircraft with the new skid is within the weight and balance limits defined by the aircraft manufacturer for the empty aircraft.

**4. Limitations**

N/A

**5. Manuals**

N/A

**6. Release to service**

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC083a****EXCHANGE OF FLEXIBLE SEALS ON CONTROL SURFACES****1. Purpose**

This SC is intended to allow exchange of flexible seals as installed on control surfaces on wings and empennages.

This SC is intended to allow exchange of flexible seals as installed on control surfaces on wings and empennages and/or to change the joint means of the seal (e.g. use of screws/bolts instead of glue-type joint).

**2. Applicability/Eligibility**

Sailplanes and powered sailplanes, LSA, and VLA.

**3. Acceptable methods, techniques and practices**

Typically the installation is by bonding tapes to the surfaces of the control surface and/or wing or tail surface.

Before exchange the old seal and any left-overs of the old bonded seal/glue needs to be removed.

Any applicable instructions provided by the aircraft manufacturer or STC holder must be applied to avoid damages to the installation area.

In addition to the use of self-adhesive tapes, glue of an industrial glue type for flexible seals needs to be used.

Before performing the new glue bonding, clean all surfaces and prepare to press the new seal to the surface during drying/application.

Check for full displacement of any control surface after installation of the new seals – it is good practice to do this on a disassembled aircraft as the disassembled wing/tail area may have more rudder deflection range than after installation on the aircraft.

When changing towards a Mylar-type of seal (or a metal seal), it is recommended to test that the Mylar tape (metal strip) is in contact to the control surface over the full range of control surface movement to prevent reduction of performance or later noise during deflections.

— After installation of the replacement seals, a check during the next flight against noises or influence upon controllability shall be performed. The exchange is not allowed if the seals do not have the proper size (i.e. are not long enough so that parts of the control surface have no seal installed, or expose a gap in the sealing towards full control surface deflection)

Additionally, verify that the movement of the flight controls is not impaired by the new skids.

**4. Limitations**

N/A

**5. Manuals**

N/A

**6. Release to service**

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC102a****INSTALLATION OF DC POWER SUPPLY SYSTEMS (PSS) FOR PORTABLE ELECTRONIC DEVICES (PED)****1. Purpose**

Installation of DC power supply systems (DC-PSS) which connect aeroplane electrical power to portable electronic devices (PED).

**2. Applicability/Eligibility**

Aeroplanes not being complex motor-powered aircraft, rotorcraft not being complex motor-powered aircraft and any ELA2 aircraft.

**3. Acceptable methods, techniques and practices**

The following standards contain acceptable data:

- FAA Advisory Circular AC 43.13-1B, Chapter 11, Section 15 (on bonding).

Additionally the following applies:

- Any modification of electrical wiring is performed in accordance with acceptable practices such as the aircraft maintenance manual or Chapter 11 of FAA Advisory Circular AC 43.13-1B;
- The design of the DC-PSS and its installation shall:
  - provide circuit protection (e.g. circuit breakers) against system overloads, smoke and fire hazards resulting from intentional or unintentional systems shorts, faults, etc.;
  - provide a clearly labelled 'on/off switch' for deactivating the entire DC-PSS, easily accessible by the pilot in command in flight.

Note: the use of circuit breakers as switches is not acceptable as it can degrade their protection function;
  - The on/off switch is not mandatory for USB outlets provided that the PEDs power supply cables are easily accessible in flight to be disconnected from the USB outlets at any time by the crew member;
  - The socket installation shall be such as to prevent the ingress of fluid and also to minimise the possibility that conductive objects could be inserted into the socket;
  - When installed in the cockpit:
    - the DC-PSS shall not affect the proper operation of the Magnetic Direction Indicator;
    - the DC-PSS shall not impair access, view or operation of cockpit controls or instruments; and
    - the DC-PSS shall not unduly impair the external view of the pilot.
- If there are essential power supplied systems or equipment, i.e. systems or equipment necessary for continued safe flight and landing; then:
  - the DC-PSS shall be powered from a non-essential supply (bus bar) of the aircraft;





- an electrical load analysis (ELA) or electrical measurements shall be undertaken, taking into account the maximum loading that may be utilised from the PSS for PED to substantiate that the aeroplane's electrical power generating system has sufficient capacity to safely provide the maximum amount of power required by the PSS for PED. This assessment shall be recorded in the Form 123; and
  - the equipment shall be qualified to appropriate standard (e.g. EUROCAE ED-14/RTCA DO-160) to ensure that the levels of conducted and radiated interference generated by the PSS do not cause an unacceptable degradation of performance of essential systems or equipment.
- If applicable, the equipment is authorised according to the applicable ETSO/JTSO or equivalent;
  - The equipment is qualified for the environmental conditions to be expected during normal operation;
  - Instructions and tests defined by the equipment manufacturer shall be followed.

#### 4. Limitations

This SC does not cover the approval of the use of portable electronic devices. The responsibility of establishing the suitability of use of PEDs on an aeroplane model remain with the operator/pilot in command.

This SC only allows the installation of DC-PSS with a maximum power per outlet limited to 20 watts.

Any limitation defined by the equipment manufacturer applies.

#### 5. Manuals

If needed, amend the AFM with AFMS containing equipment instructions for operation including the maximum load that can be connected to the DC-PSS, as required.

Amend the instructions for continued airworthiness to establish maintenance actions/inspections and intervals, as required.

#### 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC103a****EXCHANGE OF INTERIOR MATERIAL COVERING FLOOR, SIDEWALL AND CEILING****1. Purpose**

Exchange of existing interior material covering floor, sidewall, and ceiling.

**2. Applicability/Eligibility**

Aeroplanes not being complex motor-powered aircraft, rotorcraft not being complex motor-powered aircraft, and any ELA2 aircraft.

**3. Acceptable methods, techniques and practices**

The following standards contain acceptable data:

- FAA Advisory Circular AC 23-2A Change 1

Interior material (e.g. carpets) can be replaced by new materials (e.g. carpets) under the following conditions:

- the shape is taken from the original OEM material installed in the aircraft;
- the same attachment method is used as for the OEM installation;
- impact on weight and balance needs to be considered; and
- ‘flame resistant’ capability of the material installed on aircraft other than gliders, motor-powered gliders, LSA, and balloons must be demonstrated. ‘Flame resistant’ capability can be demonstrated by:
  - compliance with ‘flame resistance’ requirements proven by means of FAA AC 23-2A Change 1 §8 b, or equivalent, and documented by appropriate test reports released by the material suppliers, or
  - compliance with any other more stringent flammability tests (e.g. vertical tests of FAR/CS-25 Appendix F), or
  - successful execution of the following ‘Flame Resistant’ tests referenced or recorded in EASA Form 123:

‘Flame Resistant’ test

- a. Test specimens. Three specimens, approximately four-inches wide and 14 inches long, should be tested. Each specimen should be clamped in a metal frame so that the two long edges and one end are held securely. The frame should be such that the exposed area of the specimen is at least two-inches wide and 13 inches long, with the free end at least 0,5 inch from the end of frame for ignition purposes. In the case of fabrics, the direction of the weave corresponding to the most critical burn rate should be parallel to the 14 inch dimension. A minimum of 10 inches of the specimen should be used for timing purposes and approximately 1,5 inches should burn before the burning front reaches the timing zone. The specimen should be long enough so that the timing is stopped at least 1 inch before the burning front reaches the end of the exposed specimen.
- b. Test procedure. The specimens should be supported horizontally and tested in draft-free conditions. The surface that will be exposed when installed in the aircraft, should face down for the test. The specimens should be ignited by a Bunsen or Tirrill burner. To be acceptable, the average burn rate of the three specimens must not exceed 4 inches per



minute. Alternatively, if the specimens do not support combustion after the ignition flame is applied for 15 seconds, or if the flame extinguishes itself and subsequent burning without a flame does not extend into the undamaged areas, the material is also acceptable. (Federal Specification CCC-T- 191b, Method 5906, may also be used for testing materials of this type, but the material should not exceed the above 4 inches per minute burn rate.)

#### **4. Limitations**

Firewall coverings are excluded.

#### **5. Manuals**

N/A.

#### **6. Release to service**

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC104a****INSTALLATION OF LIGHTWEIGHT IN-FLIGHT RECORDING SYSTEMS****1. Purpose**

This SC covers new installations of lightweight in-flight recording systems. Lightweight in-flight recording systems record flight data, cockpit audio or cockpit images in a robust recording medium primarily for the purposes of operational monitoring, training, and incident analysis. They may also provide valuable data in the case of an accident investigation.

The installation of external antennas or additional batteries is not covered by this SC.

This SC is not suitable for deployable<sup>10</sup> equipment.

*Note: lightweight in-flight recording systems may encompass information collection and monitoring systems specified in CS-ETSO 2C-197. However, in-flight recording systems are not required to be compliant with CS-ETSO 2C-197.*

**2. Applicability/Eligibility**

Aeroplanes not being complex motor-powered aircraft, rotorcraft not being complex motor-powered aircraft and any ELA2 aircraft.

**3. Acceptable methods, techniques and practices**

The following standards contain acceptable data:

- FAA Advisory Circular AC 43.13-2B Chapter 2 for any eligible aircraft, or
- CS-SC403a if the equipment is self-contained, has internal batteries and no external wiring, and is installed on a balloon or a sailplane,

Additionally, the following applies:

- The maximum weight of the equipment including mountings does not exceed 250 g;
- The equipment is qualified for the environmental conditions to be expected during normal operation;
- The equipment relies exclusively on its own sensors, microphones, cameras and antennas for getting data and it has no data connection to the systems, instruments or sensors of the aircraft;
- Equipment antennas are either internal to the equipment or are installed in accordance with the appropriate CS;
- If the equipment power supply does not rely on internal batteries, it meets the electrical requirements set in Chapter 2 of FAA Advisory Circular AC 43.13-2B;
- The equipment records cockpit audio or flight data or cockpit images, or a combination thereof; and
- The equipment meets the requirements of the chapters of Section 2 of EUROCAE ED-155, Minimum Operational Performance Specifications for Lightweight Flight Recording Systems (dated July 2009), as listed in the table below.

<sup>10</sup> As per EUROCAE ED-155 'Minimum Operational Performance Specification for lightweight flight recording systems', 'A deployable recorder is any robust recording system (ADRS, CARS or other) which is designed to be automatically separated from the aircraft only in the event of an accident.'

Section 3 of ED-155 is dedicated to deployable equipment.



Applicable chapter of Section 2 of ED-155	Required compliance
Chapter 2-1	<p>Compliance is required for all specifications except the following:</p> <ul style="list-style-type: none"> <li>— 2-1.3.2 (Maintenance): maintenance tasks do not need to be defined.</li> <li>— 2-1.3.4 (Documents for compliance): Documents do not need to be provided to the accident investigation authority, however, the procedures and documentation necessary for retrieval of the recorded information from undamaged equipment and reproduction of the original recorded information must be provided to the aircraft owner or made publicly available by the equipment manufacturer.</li> <li>— 2-1.5 (Recorder operation): Not required when the aircraft is a sailplane or a balloon.</li> <li>— 2-1.8 (Equipment design specifications): Not required.</li> <li>— 2-1.14.2 (Survival criteria): the high temperature fire test and the static crush test are not required for ELA2 aircraft.</li> </ul>
Chapter 2-3	Compliance is required for all these specifications
Chapter 2-4	<p>Compliance is required for all specifications except the following:</p> <ul style="list-style-type: none"> <li>— 2-4.2.4 (High temperature fire) and 2-4.2.3 (static crush): Not required for ELA2 aircraft.</li> </ul>

- Instructions and tests defined by the equipment manufacturer are followed.

#### 4. Limitations

- Any limitations defined by the equipment manufacturer apply.
- The equipment installation cannot be used to extend the operational capability of the specific aircraft or to give credit for meeting a flight recorder carriage requirement.

#### 5. Manuals

Amend AFM with AFMS containing or referencing the equipment instructions for operation, as required.  
Amend the instructions for continued airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required.

#### 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



## Standard Change CS-SC202ab

### USE OF AVIATION GASOLINE (AVGAS) UL 91

#### 1. Purpose

Unleaded Avgas UL 91 (according to ASTM D7547 or Def Stan 91-90) may be used if approved for the particular engine types and the installation at aircraft level is already approved for operation with conventional Avgas or Motor Gasoline (Mogas).

Avgas UL 91 may also be used in all engines and aircraft types approved for use with Mogas RON 95 (MON 85) in accordance with Standard EN 228.

Even if approved for the engine, the operation with Avgas UL 91 is a modification at aircraft level, and placards and manuals have to be amended which could be done using this SC.

#### 2. Applicability/Eligibility

Aeroplanes other than complex motor-powered aircraft, and powered sailplanes with spark-ignited piston engines using Avgas or Mogas.

#### 3. Acceptable methods, techniques and practices

To enable the use of unleaded Avgas UL 91 with this SC, the following conditions are to be met:

- the engine installed on the aircraft is approved for use of unleaded Avgas UL 91 and the aircraft is already approved for operation with conventional Avgas (according to ASTM D910, Def Stan 91-90, Mil-G-5572, GOST1012-72 or equivalent) or Mogas; or
- the engine as well as the aircraft are approved for operation with Avgas Grade 80<sup>11</sup>; or
- the engine as well as the aircraft are approved for operation with Mogas RON95 (MON 85) in accordance with standard EN 228;
- the installed engine has not been modified and meets the specifications of the original engine Type Certificate; and
- placards are installed/amended as needed to allow the use of the approved fuels.

#### **Warning 1:**

***Use of unleaded Avgas UL 91 in engines that have not been approved for its use may cause extensive damage to the engine or lead to in-flight failure due to the lower Motor Octane Number (MON) of the fuel, compared to Avgas 100LL.***

#### **Warning 2:**

***This SC is not intended for approving the use of automotive fuel.***

#### 4. Limitations

<sup>11</sup> Operating limitations may specify grade 80 Avgas in various forms including “grade 80/87”, “80 minimum”, “80/87”, “80”, or “80 octane fuel or lower grades” as per FAA SAIB HQ-16-05R1 or later revisions.



None.

**5. Manuals**

Amend AFM with AFMS introducing the aircraft operation with unleaded Avgas UL 91.

**6. Release to service**

The Pilot-owner may release to service the aircraft after embodiment of this SC, subject to compliance with AMC M.A.801.



## Standard Change CS-SC203ab

### USE OF AVIATION GASOLINE (AVGAS) HJELMCO 91/96 UL AND 91/98 UL

#### 1. Purpose

Unleaded Avgas Hjelmc0 91/96 UL and 91/98 UL (meeting the requirements of MIL-G-5572 and ASTM D910 for grade 91/96 and 91/98 fuel (except of colour), as well as the requirements of ASTM D7547 and Def Stan 91-90) may be used if approved for the particular engine types, and the installation at aircraft level is already approved for operation with conventional Avgas or Motor Gasoline (Mogas).

Avgas Hjelmc0 91/96 UL and 91/98 UL may also be used in all engines and aircraft types approved for use with Mogas RON 95 (MON 85) or RON 98 (MON 88) in accordance with Standard EN 228.

Even if approved for the engine, the operation with Avgas 91/96 UL or 91/98 UL is a modification at aircraft level, and placards and manuals have to be amended. This could be done using this SC.

#### 2. Applicability/Eligibility

Aeroplanes other than complex motor-powered aircraft and powered sailplanes with spark-ignited piston engines using Avgas or Mogas.

#### 3. Acceptable methods, techniques and practices

Before releasing the use of unleaded Avgas Hjelmc0 91/96 UL and 91/98 UL with this SC, the following conditions are to be met:

- the engine installed on the aircraft is approved for use of unleaded Avgas 91/96 UL or 91/98 UL (or UL 91) and the aircraft is already approved for operation with conventional Avgas (according to ASTM D910, Def Stan 91-90, Mil-G-5572, GOST1012-72 or equivalent) or Mogas, or;
- the engine as well as the aircraft are approved for operation with Avgas Grade 80<sup>12</sup>; or
- the engine as well as the aircraft are approved for operation with Mogas RON 95 (MON 85) or RON 98 (MON 88) in accordance with standard EN 228;
- the installed engine has not been modified and meets the specifications of the original engine Type Certificate; and
- placards are installed/amended as needed to allow the use of the approved fuels.

#### Warning 1:

***Use of unleaded Avgas 91/96 UL or 91/98 UL in engines that have not been approved for their use may cause extensive damage to the engine or lead to in-flight failure due to the lower Motor Octane Number (MON) of the fuel, compared to Avgas 100LL.***

#### Warning 2:

<sup>12</sup> Operating limitations may specify grade 80 Avgas in various forms including “grade 80/87”, “80 minimum”, “80/87”, “80”, or “80 octane fuel or lower grades” as per FAA SAIB HQ-16-05R1 or later revisions.





***This SC is not intended for approving the use of automotive fuel.***

**4. Limitations**

None.

**5. Manuals**

Amend AFM with AFMS introducing the operation of unleaded Avgas Hjelmc0 91/96 UL and 91/98 UL (unless the use of Avgas UL91 is already approved).

**6. Release to service**

The Pilot-owner may release to service the aircraft after embodiment of this SC, subject to compliance with AMC M.A.801.



**Standard Change CS-SC205a****INSTALLATION OF FUEL LOW LEVEL SENSOR (FLLS)****1. Purpose**

This SC covers the new installation of fuel low level sensors (FLLS) and related fuel low level caution light for aircraft not already equipped with similar system.

**2. Applicability/Eligibility**

ELA1 aeroplanes certified only for VFR operations.

**3. Acceptable methods, techniques and practices**

The following standards contain acceptable data:

- The installation of the FLLS shall not introduce ignition source in the fuel tank and shall be installed in accordance with acceptable practices such as the aircraft maintenance manual or FAA Advisory Circulars AC 43.13-1B and AC 43.13-2B;
- The system shall be suitable for the environmental conditions to be expected during normal operation (fuel, electrical system etc. ...);
- In case of multi-tank fuel system, the installation must be done at least on each tank directly feeding an engine and the fuel flow logic should be adequately considered
- Instructions and tests defined by the system manufacturer shall be followed;
- The FLLS installation shall not interfere with previously installed fuel measurement system;
- Installation of the FLLS shall be done such that the caution light to be installed on the instrument panel is triggered when the remaining usable fuel quantity per tank reaches the quantity needed for running the engine 30 minutes (approximately) at maximum continuous power per tank;
- Installation shall be verified by filling up empty fuel tank on ground with the aircraft at normal flight level attitude to measure the usable fuel quantity when the caution light is triggered. Manufacturer instructions and information, such as unusable fuel and fuel consumption at maximum power, shall be considered when calculating the remaining time before starvation. The calculated time, which should be close to 30 minutes, shall be quoted in the placard in the vicinity of the fuel low level caution light.

**4. Limitations**

- Any limitation defined by the equipment manufacturer applies.

**5. Manuals**

The AFMS shall, at least, contain:

- the system description, operating modes and functionality;
- limitations, warnings and placards at least for the following:
  - 'For situational awareness only' and
  - remaining time at maximum continuous power;
- emergency and normal operating procedures, as required.



Amend the instructions for continued airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required.

**6. Release to service**

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC251ab****INSTALLATION OF AN ANGLE OF ATTACK (AOA) INDICATOR SYSTEM****1. Purpose**

This SC applies only to a supplemental AoA indicator system, not to the AoA system required for the aircraft type certification.

**2. Applicability/Eligibility**

Sailplanes, powered sailplanes and aeroplanes not considered complex motor-powered aircraft.

**3. Acceptable methods, techniques and practices**

The following standards contain acceptable data:

- FAA Memo AIR100-14-110-PM01

*Note: as an alternative to the FAA approval letter referred to in the FAA Memo, Part-66 approved certifying staff may accept also a declaration of compliance with the ASTM F3011-13 standard issued by the manufacturer of the AoA to be installed.*

Additionally, the following applies:

- the installation of the system neither requires an interface with the pitot-static system nor relies on direct pressure input from the pitot-static system;
- the probe is located in such a way that it interferes neither with the functioning of the flight controls nor with the pitot-static system or aircraft stall warning system;
- accuracy of stall indication coincides with existing stall warning;
- the installed AoA indicator system shall not interfere negatively with previously installed stall warning or AoA systems;
- the installation of the probe is in a non-pressurised area, preferably on an inspection panel;
- the system is not used as an input source to any other system, such as an autopilot, stick pusher, envelope protection system or comparable function, unless certified separately;
- the installation and electrical wiring is installed in accordance with acceptable practices such as the aircraft maintenance manual or FAA Advisory Circulars AC 43.13-1B and AC 43.13-2B;
- the system is suitable for the environmental conditions to be expected during normal operation; and
- instructions and tests defined by the system manufacturer have to be followed.

**4. Limitations**

The provided information is used in an advisory or supplementary manner (no hazard, no credit basis).

No operational credit may be taken for the installation, such as reduced stall speeds, reduced approach speeds, reduced take-off or landing distances, etc.

Any limitations defined by the AoA system manufacturer apply. Install the limitation placards, as required.



## 5. Manuals

The AFMS shall, at least, contain:

- the system description, operating modes and functionality;
- limitations, warnings and placards; and
- emergency and normal operating procedures .

Amend the instructions for ~~Continuing~~ continued Airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required.

## 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



## Standard Change CS-SC401ab

### EXCHANGE OF BASIC FLIGHT INSTRUMENTS

#### 1. Purpose

Exchange of basic flight instruments with new equipment applicable to:

- airspeed instruments;
- turn and slip instruments;
- bank and pitch instruments;
- direction instruments;
- vertical velocity instruments; and
- pressure-actuated altimeter instruments.

This SC does not entitle the installation of digital multifunction displays. However, a combination of turn, slip, bank, and pitch in one instrument is acceptable.

#### 2. Applicability/Eligibility

Aeroplanes not being complex motor-powered aircraft, and any ELA2 aircraft with a maximum flight altitude below FL 280.

#### 3. Acceptable methods, techniques and practices

The following standards contain acceptable data:

- FAA AC 43-13-2B, Chapter 11.

Additionally, the following applies:

- the instrument is authorised according to the applicable ETSO/JTSO or equivalent;
- the instrument has the same functionality, is installed at the same location, and display of information is consistent with the overall flight deck design philosophy;
- the instrument is suitable for the environmental conditions to be expected during normal operation;
- the indicators have the required markings (e.g. limits, operating ranges) of the original instrument;
- selection/calibration of the instrument must be such that, under the same conditions, the indications provided by the old and the new instrument are the same;
- instructions and tests defined by the equipment manufacturer have to be followed; and
- the instrument should provide the measurement of the related magnitude in the same units as the exchanged instrument or other units when such units are used in the AFM and the related placards have been updated as necessary.

#### 4. Limitations

Any limitations defined by the instrument manufacturer apply.



Any limitations of the existing installation remain valid.

#### 5. Manuals

Amend AFM with AFMS containing or referencing the instrument's instructions for operation, as required.

Amend the instructions for ~~Continuing~~ continued Airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required.

#### 6. Release to service

This SC is not suitable for release to service by the Pilot-owner.



**Standard Change CS-SC403a****PROVISIONS FOR THE INSTALLATION OF LIGHTWEIGHT CAMERAS.****1. Purpose**

Structural provisions for the installation of internally or externally mounted lightweight cameras on aircraft. The mounted camera needs to be self-contained, with internal batteries and no external wiring.

This SC concerns aircraft mounted cameras only.

**2. Applicability/Eligibility**

ELA2 aircraft.

**3. Acceptable methods, techniques, and practices**

Definitions:

- 'Installer' means the person releasing to service the aircraft i.a.w. AMC M.A.801 (carrying out this SC).
- 'User' means the pilot who attaches the camera to the aircraft in accordance with the data established and released by the Installer.

The following standards contain acceptable data:

- CAA UK CAP 1369<sup>13</sup>, Policy and Guidance on mounting cameras on aircraft, Appendix A. The referenced light aircraft engineer (LAE) is to be substituted by the person releasing to service the aircraft i.a.w. AMC M.A.801.
- As part of applying this SC the installer shall:
  - define and record locations where a camera can be installed on the individual aircraft; and
  - list acceptable and tested camera mountings, identifiable by a part number or similar.

Additionally the following considerations apply:

- For cameras mounted inside the aircraft and behind occupants a pull test in the direction of flight for the primary mounting and the secondary retention, if applicable, shall be performed using at least 15 times the weight of the unit.
- In the particular case of balloons, pull tests are:
  - to be performed on all positions where the camera can be installed, and
  - to be done in all possible landing directions, including vertically downwards (-z).

**4. Limitations**

Maximum mass of the camera including mountings shall not exceed 250 g.

**5. Manuals**

The installer shall amend the AFM by an AFMS, which indicates:

- dedicated locations where cameras can be attached;

<sup>13</sup> The document is available at the following website: <http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=7204>





- which combination of mountings and cameras (identified by part numbers) are suitable at each location;
- how the mounting is to be attached; and
- that GSM, UMTS, LTE, or similar transmission technologies with unknown or more than 100 mW output power shall be switched off during flight.

Based on the AFMS, cameras and their mounting systems can be attached by the user for the individual flight.

Amend the instructions for continued airworthiness (ICA) to establish maintenance actions/inspections and intervals, as outlined by CAA UK CAP 1369, Policy and Guidance on mounting cameras on aircraft unless the AFMS limits the duration of the camera mount attached to less than 24 hours.

#### **6. Release to service**

This SC and changes to it are not suitable for release to service by the Pilot-owner.

*Note: Attaching the camera to the aircraft in accordance with the AFMS is not considered as maintenance according to Part-M and does not require a release to service, as the AFMS contains detailed instructions how to attach the camera and its mounting system.*



## SUBPART C — STANDARD REPAIRS

### LIST OF STANDARD REPAIRS

CS-SR801a — Aircraft Repair according to FAA Advisory Circular AC 43.13-1B

CS-SR802ab — Repair of Sailplanes, Powered Sailplanes, LSA and VLA

CS-SR803a — Repair of canopy cracks by drilling a stopping hole

CS-SR804a — Use of epoxy adhesive for minor repairs of wood and wooden mixed structures



## Standard Repair CS-SR802ab

### REPAIR OF SAILPLANES, POWERED SAILPLANES, LSA AND VLA

#### 1. Purpose

This SR is issued to allow the use of established practice for the repair of metal, composite, wood and mixed structures of light aircraft.

#### 2. Applicability/Eligibility

Sailplanes and powered sailplanes, as defined in ELA2, LSA, and VLA.

#### 3. Acceptable methods, techniques and practices

Any of the following standards contain acceptable data:

for composite structures:

- ‘Kleine Fiberglas Flugzeug Flickfibel’ by Ursula Hänle<sup>14</sup>, and

for wooden and mixed structures on sailplanes and powered sailplanes:

- ‘Standard Repairs to Gliders’ by the British Gliding Association<sup>15</sup>, or
- ‘Werkstattpraxis für den Bau von Gleit- und Segelflugzeugen’ by Hans Jacobs.

for skin only:

- ‘Manuel de Reparation Generique pour la Reparation Des Planeurs en Materiaux Composites R02-15-A01’, indice B<sup>16</sup>, issued by Federation Francaise de Vol a Voile

#### 4. Limitations

- The person responsible for the design of the repair must be familiar enough with the applicable airworthiness requirements to determine that the repair data developed from the references in paragraph 3 above is appropriate to the product being repaired.
- Where suitable TC holder approved repair data exists, this should be used before a SR is considered.
- For bonded repairs, the SR should not exceed a size above which the limit load cannot be sustained if the repair fails, unless the person responsible for the repair is sufficiently experienced with the design data, materials, process, repair size and aircraft configuration.

*Note: Where there is any doubt as to whether following the references in paragraph 3 will result in compliance with the applicable requirements, instead of applying this SR, a repair design approval in accordance with Part-21 should be obtained. Particular attention should be paid to repair designs where there is a risk of adversely affecting fatigue or aeroelastic characteristics and the recommendations of the references should be followed.*

<sup>14</sup> Available under <http://www.dg-flugzeugbau.de/flickfibel-d.html>. Also available in English under the title ‘Plastic Plane Patch Primer’.

<sup>15</sup> Available under <https://members.gliding.co.uk/library/standard-repairs-to-gliders>

<sup>16</sup> Indice B contains changes agreed with EASA, subsequent amendments shall be used only if referred to in CS-STAN.



**5. Manuals**

Assess if the repair could require the issuance of an AFMS.

Amend the Instructions for Continuing continued Airworthiness (ICA) to establish maintenance actions/inspections and intervals, as required.

**6. Release to service**

This SR is not suitable for release to service by the Pilot-owner.



**Standard Repair CS-SR803a****REPAIR OF CANOPY CRACKS BY DRILLING A STOPPING-HOLE****1. Purpose**

This SR is intended to stop further growth of a crack in a transparent canopy made from acrylic glass (often known as Plexiglas) by drilling a small hole at the end of the crack to stop increase of the crack length, as a temporary repair.

**2. Applicability/Eligibility**

Sailplanes and powered sailplanes, as defined in ELA2, LSA, and VLA.

**3. Acceptable methods, techniques and practices**

The hole shall not be smaller than the thickness of the material (i.e. typically not larger than 2-3 mm diameter) and the centre of the hole shall be at the extension of the axis of the crack.

**4. Limitations**

- Any crack repaired by a stopping-hole should be a temporary repair. An approved permanent repair should be performed as soon as practically possible to prevent further crack growth or other damage. At the latest the final repair shall be performed during the next aircraft annual inspection;
- Repair of a crack by drilling a stopping-hole is only permitted by this SR if:
  - the crack to be repaired by this SR is no longer than 10 cm (measured along the crack);
    - there are not more than 3 cracks with a maximum length of 5 cm each per canopy;
  - the crack to be repaired is not in the front section of the canopy (i.e. in the region where the pilot/co-pilot has to look through when looking forward);
  - a crack with side arms (a crack splitting into several arms) must not have more than 2 arms (2 ends) to be repaired by this SR; and
  - after applying this SR any growth of the crack at the end of the stopping-hole is observed. In such case the crack should be permanently repaired by using approved repair data before further flight.
- Where suitable TC-holder-approved repair data exists, this shall be applied before a SR is considered.

**5. Manuals**

Supplement the pre-flight inspection to introduce an inspection of the crack for any growth until a permanent repair is embodied.

Record in the list of deferred defects the need to permanently repair the canopy at the time of the next annual check or 100 hours inspection, whichever comes first.

**6. Release to service**

This SC is not suitable for release to service by the Pilot-owner.



**Standard Repair CS-SR804a****USE OF EPOXY ADHESIVE FOR MINOR REPAIRS OF WOOD AND WOODEN MIXED STRUCTURES****1. Purpose**

This SR is issued to enable the use of epoxy resin system as an alternative adhesive/bonding system instead of initially approved conventional wood glue systems for the repair of wood and wooden mixed structures.

The repair design and method described in the applicable instruction for continued airworthiness (such as a structural repair manual) provided by the TC holder must be applied. This SR only allows the use of different adhesive/bond for the gluing process.

**2. Applicability/Eligibility**

Aeroplanes, sailplanes and powered sailplanes as defined in ELA 1,

**3. Acceptable methods, techniques and practices**

The following standard contains acceptable data:

- General handling instructions for the use of epoxy adhesive for the repair of wood and wooden mixed structures form AEROCLUB | NRW<sup>17</sup>

**4. Limitation**

- The SR is limited to repairs on wooden parts only falling into any of the following categories:

- any non-structural parts such as fairings, sidewalls, etc.;
- any rib other than main structural ribs;
- structural skin on wing, fuselage and empennage, with less than 10 % of total component area;
- the size and position do not impair a safe flight in case the repair would fail.

Any repair beyond these limits shall be approved in accordance with Part-21.

- As adhesive T-88<sup>18</sup> or Araldit<sup>19</sup> can be used.
- This SR does not cover simultaneous application of different glue types with different chemical properties.
- The person responsible for the design of the repair must be familiar enough with the applicable airworthiness requirements to determine that the repair data developed from the references in paragraph 3 above is appropriate to the product being repaired.
- The use of epoxy adhesive is allowed provided that this does not result in the need for a limitation on the aircraft capability.

*Note: Where there is any doubt as to whether following the references in paragraph 3 will result in compliance with the applicable requirements, instead of applying this SR, a repair design approval in accordance with Part-21 should be obtained. Particular attention should be paid to repair designs where there*

<sup>17</sup> Available under <http://www.daec.de/technik/downloads>

<sup>18</sup> T-88 is a trademark of SystemThree.

<sup>19</sup> Araldit 185B is a trademark of Bodo Möller Chemie.



*is a risk of adversely affecting fatigue, environmental conditions such as high temperature due to color marking and painting or aero elastic characteristics and the recommendations of the references should be followed.*

#### **5. Manuals**

Amend the instructions for continued airworthiness (ICA) to note the areas where non-original adhesive was used for bonding and to establish maintenance actions/inspections and intervals, as required.

#### **6. Release to service**

This SR is not suitable for release to service by the Pilot-owner.



## 4. References

### 4.1. Affected regulations

N/a

### 4.2. Affected decisions

Decision No. 2015/016/R of the Executive Director of the Agency of 8 July 2015 on Certification Specifications for Standard Changes and Standard Repairs (CS-STAN)

### 4.3. Reference Documents

None

