CS-STAN ISSUE 3 — CHANGE INFORMATION

EASA publishes amendments to certification specifications as consolidated documents. These documents are used for establishing the certification basis for applications made after the date of entry into force of the amendment.

Consequently, the consolidated text of CS-STAN does not allow readers to see the detailed changes that have been introduced by the new amendment. To allow readers to also see these detailed changes, this document has been created. The same format as for publication of notices of proposed amendments (NPAs) has been used to show the changes:

— deleted text is ~~struck through~~;

— new or amended text is highlighted in grey;

— an ellipsis '[…]' indicates that the rest of the text is unchanged.

SUBPART A — GENERAL

CS STAN.05 Embodiment of current SCs/SRs

As CS-STAN evolves, some SCs/SRs are amended, and their revision status is increased (e.g. CS-SC.XXXa is replaced with CS-SC.XXXb). In this respect, the new SC/SR version (in the example, CS-SC.XXXb) is the only one that is current and acceptable, and the old SC/SR version (in the example CS-SC.XXXa) becomes no longer acceptable for new embodiments.

Therefore, the following principles apply:

— It is mandatory to install the SC/SR using the latest revision that has been published.

— Always refer to the revision of the SC/SR in EASA Form '123'.

Note: A change or repair that was embodied against an older version of the relevant SC/SR, which was in force at the time of the embodiment, remains valid when a new revision of the SC/SR demands more conditions to be met, unless EASA mandates additional considerations by means of an airworthiness directive (AD).

CS STAN.80 Definitions and ~~A~~abbreviations

[…]

'AC' means advisory circular.

'AD' means airworthiness directive.

[…]

'AMC' means acceptable means of compliance.

[…]

'CS' means certification specification.

'CO' means carbon monoxide.

[…]

‘DC’ means direct current.

[…]

‘GA’ means general aviation.

[…]

‘EMI’ means electromagnetic interference.

[…]

‘IAS’ means international standard atmosphere.

[…]

‘Installation’ means the embodiment in/on the aircraft of an item of equipment, an instrument or a system ~~to provide a new function or new information not previously available at the aircraft~~. Unless otherwise mentioned, whenever an SC covers an ‘~~I~~installation’ of an item of equipment/an instrument/a system, the exchange of the item of equipment/instrument/system is also covered by the same SC.

[…]

‘NACp’ means navigation accuracy category for position.

‘NVG’ means night-vision goggles.

‘PSS’ means power supply system.

[…]

‘SC’ means standard change.

‘SR’ means standard repair.

‘SDA’ means system design assurance.

‘SIB’ means safety information bulletin.

‘SIL’ means source integrity level.

‘SMM’ means structural maintenance manual.

‘TABS’ means traffic awareness beacon system:

A Class A TABS:

— includes the transponder, an altitude source, and ADS-B OUT functionality; refer to ETSO-C199, subparagraphs (1), (2), and (3);

— consists of a Class A device, or a TSO-C112e- and TSO-C166b-compliant device.

A Class B TABS:

— includes the global navigation satellite system (GNSS) position source functionality; refer to ETSO-C199, subparagraph (4);

— consists of a Class B device, or an ETSO-C129a (cancelled), ETSO-C145c or later revision, ETSO-C146c or later revision, or ETSO-C196b-compliant GPS.

‘TAS’ means: traffic advisory system; true air speed (depending on context).

[…]

SUBPART B — STANDARD CHANGES

LIST OF STANDARD CHANGES

Group Systems — Communication:

CS-SC001a — Installation of VHF voice communication equipment

CS-SC002~~b~~c — Installation of ~~a~~ Mode S elementary surveillance equipment

CS-SC003~~b~~c — Installation of ~~A~~audio ~~S~~selector ~~P~~panels and ~~A~~amplifiers

CS-SC004a — Installation of antennas

SC-SC005a — Installation of an ADS-B OUT system combined with a transponder system

Group Systems — Electrical:

CS-SC031b — Exchange of conventional Anti-Collision Lights, Position Lights and Landing & Taxi lights by LED-type lights

CS-SC032b — Installation of anti-collision lights

CS-SC033a — Installation of cabin and cockpit conventional lights by LED-type lights

CS-SC034~~a~~b — Exchange of an existing battery ~~by~~ for a ~~L~~lithium ~~I~~iron ~~P~~phosphate ($LiFePO_4$) ~~batteries~~ battery system

CS-SC035a — Installation of solar cells on sailplanes

CS-SC036a — Installation of visual awareness lights

CS-SC037a — Exchange of a main aircraft battery

CS-SC038a — Installation of DC to DC converters

Group Systems — Avionics/NAV/Instruments:

CS-SC051~~b~~c — Installation of 'FLARM' equipment

CS-SC052~~b~~c — Installation of VFR GNSS equipment

CS-SC053b— Installation of Radio Marker Receiving equipment

CS-SC054b — Exchange of Distance Measurement Equipment (DME)

CS-SC055b — Exchange of ADF equipment

CS-SC056b — Exchange of VOR equipment

SC-SC057a — reserved

SC-CS058a — Installation of traffic awareness beacon system (TABS) equipment

Group Systems —Mechanical and structural:

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

CS-SC084a — Repainting of composite aircraft structures

CS-SC085a — Exchange of an aircraft livery paint and decorative sticker scheme

CS-SC086a — Exchange of a balloon 'bottom-end'

Group Cabin:

CS-SC101b — 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

CS-SC105a — Installation of mounting systems to hold equipment

CS-SC106a — Installation of flight time recorders

CS-SC107a — Installation of carbon monoxide detectors

Group Survivability Equipment:

CS-SC151b~~a~~ — Installation of headrests

CS-SC152~~a~~b — Changes to seat cushions including the use of alternative foam materials

CS-SC153b — Exchange of safety belts — torso restraint systems

Group Powerplant and fuel systems:

CS-SC201~~a~~b — Exchange of powerplant instruments

CS-SC202b — Use of Avgas UL 91

CS-SC203b — Use of Avgas Hjelmco 91/96 UL and 91/98 UL

CS-SC204a — Installation of external powered engine preheater

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

CS-SC206a — Exchange of fixed-pitch wooden propellers

CS-SC207a — Exchange of the fuel cylinders on hot-air balloons

Group Flight:

CS-SC251b — Installation of an angle-of-attack (AoA) indicator system

Group Miscellaneous:

CS-SC401~~b~~c — Exchange of basic flight instruments

CS-SC402b — Installation of sailplane equipment

CS-SC403a — Provisions for the installation of lightweight cameras

Standard Change CS-SC002~~b~~c

INSTALLATION OF MODE S ELEMENTARY SURVEILLANCE EQUIPMENT

1. Purpose

This SC is for the ~~i~~installation ~~or exchange~~ of a Mode S transponder, including, optionally, an altitude encoder ~~exchange~~. The individual installation of an altitude encoder is covered by this SC.

This SC does not include the installation of antennas (see CS-SC004, which may be applied concurrently).

Note: SC-CS005 refers to the installation of ADS-B OUT equipment.

2. Applicability/Eligibility

This SC is applicable to ~~A~~aeroplanes that are not ~~being~~ complex motor-powered aircraft, and which have ~~with~~ a maximum cruising speed in ISA conditions below 250 kt TAS~~s~~, ~~and~~ to rotorcraft that are not ~~being~~ complex motor-powered aircraft, and to any ELA2 aircraft.

3. Acceptable methods, techniques, and practices

The following standard~~s~~ contains acceptable data:

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

— FAA Advisory Circular AC 43.13-1B, Chapter 11 and Chapter 12.

Additionally, the following conditions apply~~ies~~:

— The transponder equipment and its installation ~~are in compliance with~~ meet~~s~~ ~~paragraph~~ point CS ACNS.D.ELS.010 of CS-ACNS, and the altitude encoder meets ETSO-C88~~A~~a, or later amendments, or its equivalent.

— The elementary surveillance system provides data according to CS ACNS.D.ELS.015.

— 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 that is connected to the static pressure system that provides~~ing~~ pressure to the instrument used to control the aircraft.

— Any antenna connected to the transponder has a resulting radiating 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.

— The installation ~~i~~instructions from the equipment manufacturer have to be followed.

— A system ground test that verifies~~ying~~ all the transmitted data according to CS ACNS.D.ELS.015 has to be performed.

4. Limitations

Any limitations defined by the equipment manufacturer apply.

In the case of ~~rotorcraft~~ aircraft approved for NVISs/NVGs, if ~~cockpit~~ control/display panels are to be inserted, the change cannot be considered to be an SC.

~~This SC does not satisfy requirements set by 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.~~

~~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 the lowest quality, the equipment manufacturer has stated compatibility with the directly connected GNSS source, and the transponder is not authorised in accordance with ETSO-C166b or equivalent.~~

If~~n case~~ a Class A TABS ~~equipment~~ device is already installed in the aircraft, the Mode S ~~T~~transponder system cannot be installed using CS-STAN.

5. Manuals

Amend the AFM with an AFMS that contains~~ing~~ or references~~ing~~ the equipment instructions for operation, as required.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required. In particular, include in the ICAs~~,~~ a check ~~every two years in accordance~~ with content that is similar to the provisions of the latest ~~version~~ revision of EASA SIB No.: 2011-15:

— at intervals defined and published by the competent authority, or

— at intervals defined in the latest revision of EASA SIB No.: 2011-15.

~~The ground test shall also include voluntarily transmitted ADS-B data (if any).~~

6. Release to service

This SC is not suitable for the release to service of the aircraft by the ~~P~~pilot-owner.

Standard Change CS-SC003~~b~~c

INSTALLATION OF AUDIO SELECTOR PANELS AND AMPLIFIERS

1. Purpose

This SC is for the ~~i~~installation ~~or exchange~~ of audio selector panels and amplifiers.

Audio selector amplifiers that feature automatic speech recognition are eligible for installation by means of this SC only if the automatic speech recognition feature is disabled.

2. Applicability/Eligibility

This SC is applicable to ~~A~~aeroplanes and to rotorcraft that are 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; and

— FAA Advisory Circular AC 43.13-1B, Chapter 11.

Additionally, the following conditions apply~~ies~~:

— the equipment is authorised in accordance with ETSO-C50c or ETSO-C139a, or later amendments, or the equivalent;

— the equipment has at least the audio functionality of the previously installed equipment, and is compatible with the existing installation;

— the equipment is compatible with the connections to the existing communication and navigation systems;

— the equipment is qualified for the environmental conditions to be expected during normal operation; and

— the instructions and tests defined by the equipment manufacturer are followed.

4. Limitations

Any limitations defined by the equipment manufacturer apply.

Any limitations of the existing installation remain valid.

In the case of ~~rotorcraft~~ aircraft approved for NVIS/NVG, if control/display ~~cockpit~~ panels are to be inserted, the change cannot be considered to be an SC.

5. Manuals

Amend the AFM with an AFMS that contains~~ing~~ or references~~ing~~ the equipment instructions for operation, as required.

If the audio selector includes connections to equipment with functions that are not part of the aircraft's control system or navigation system, and which may emit distracting sounds, add a limitation in the AFMS stating that these functions shall not be used during take-off and landing. Examples of such functions include telephony, personal messaging functions and music players.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the ~~P~~pilot-owner.

Standard Change CS-SC005a

INSTALLATION OF AN ADS-B OUT SYSTEM COMBINED WITH A TRANSPONDER SYSTEM

1. Purpose

This SC is for the installation of ADS-B OUT systems. This SC allows the embodiment of different configurations for the voluntary transmission of ADS-B data (e.g. GPS position and velocity).

This SC addresses three cases:

— Configuration 1: an ADS-B OUT system that conforms to AMC 20-24[1];

— Configuration 2: an ADS-B OUT system with an ETSO-C199() GNSS position source;

— Configuration 3: an ADS-B OUT system with a GNSS position source that is not approved.

Note: The aircraft identified in the applicability/eligibility section of this SC do not need to comply with Commission Implementing Regulation (EU) No 1207/2011 or its later amendments. Consequently, they do not need to satisfy the requirements set by CS-ACNS Subpart D Section 4 '1090 MHz Extended Squitter ADS-B Out'.

The likelihood of erroneous data being transmitted to ADS-B ground stations and to other aircraft is defined by quality indicators.

— Configuration 1 installation provides quality indicators according to the principles that are defined in AMC 20-24 while controlling the latency through a direct connection between the transponder and the GNSS position source.

— Configuration 2 installation provides quality indicators that are defined in ETSO-C199.

— Configuration 3 sets the quality indicators to zero (0). Operators of aeroplanes fitted with a configuration 3 installation are expected to use the system for traffic awareness only. Equipment emitting with quality indicators that are set to 0 might not be seen by other aircraft systems or by ATC.

2. Applicability/Eligibility

This SC is applicable to aeroplanes that are not complex motor-powered aircraft, and that have a maximum cruising speed in ISA conditions below 250 kt TAS, to rotorcraft that are not complex motor-powered aircraft, and to any ELA2 aircraft.

3. Acceptable methods, techniques, and practices

The following standard contains acceptable data:

— FAA Advisory Circular AC 43.13-1B, Chapter 11 and Chapter 12.

For configuration 1:

The following conditions apply to configuration 1:

— The transponder equipment and its installation are compliant with CS-SC002c or later amendments, or are otherwise approved.

— The ADS-B transmit unit (transponder) is approved in accordance with ETSO-C166b, or later revisions, or the equivalent.

[1] https://www.easa.europa.eu/sites/default/files/dfu/Annex%20II%20-%20AMC%2020-24.pdf

— The GNSS installation is approved and the GNSS receiver is approved in accordance with:

- ETSO-C129a, or
- ETSO-C196a or ETSO-C145c or ETSO-C146c,

or later amendments, or the equivalent.

— There is a direct digital interface between the GNSS receiver and the transponder, or the GNSS receiver is integrated into the transponder.

— The compatibility of the combination of the transponder and the GNSS receiver for conformity to AMC 20-24, including for latency, is explicitly stated by the manufacturer of the transponder.

— The quality indicators are configured according to the principles specified in AMC 20-24. SIL is typically a static (unchanging) value, and shall be set at the time of installation. SIL is based solely on the probability of the position source exceeding the reported integrity value, and it shall be set to SIL = 3 for configuration 1. The ADS-B SDA parameter indicates the probability of an ADS-B system malfunction causing false or misleading position information or position quality metrics to be transmitted. The SDA shall be set to report SDA= 2 for configuration 1.

— The correct transmission of the required parameters, identified in Section 7 of AMC 20-24, is verified during a ground test, which is performed in accordance with the instructions provided by the manufacturer of the transponder. The guidance of Appendix 1 to EASA SIB No.: 2011-15 (latest revision) should be considered. The ground test shall also check that all the parameters transmitted for the extended squitter are consistent with the data transmitted for elementary surveillance.

— The voluntary transmission of any additional parameters is verified to be correct through a ground test that is performed in accordance with the instructions provided by the manufacturer of the transponder.

— The installation instructions from the equipment manufacturer have to be followed.

For configuration 2:

The following conditions apply to configuration 2:

— The transponder equipment and its installation are compliant with CS-SC002c or later amendments, or are otherwise approved.

— The ADS-B transmit unit (transponder) is approved in accordance with ETSO-C166b, or later revisions, or the equivalent.

— The GNSS receiver is approved as a class B ETSO-C199 TABS device.

— The transponder is configured to use a class B ETSO-C199 GNSS position source. The GNSS receiver is configured as a class B ETSO-C199 TABS device (SIL=1), which is not compliant with any of the ETSOs defined in configuration 1 for the GNSS receiver.

— The compatibility of the combination of the transponder and the GNSS receiver is explicitly stated by the manufacturer of the transponder.

— The quality indicators are configured to report the quality indicators defined in ETSO-C199 (e.g. SDA=1 and SIL=1) in accordance with the instructions provided by the equipment manufacturer.

— The installation instructions from the equipment manufacturer have to be followed.

For configuration 3:

The following conditions apply to configuration 3:

— The transponder equipment and its installation are compliant with CS-SC002c or later amendments, or are otherwise approved.

— The ADS-B transmit unit (transponder) is approved in accordance with ETSO-C166b, or later revisions, or the equivalent.

— The GNSS receiver is not approved or its installation is not certified. However, the compatibility of the combination of the transponder and the GNSS receiver is explicitly stated by the manufacturer of the transponder.

— The quality indicators are configured according to the manufacturer instructions to report the lowest quality (e.g. SIL = 0 and SDA = 0, NACp = 0).

— The installation instructions from the equipment manufacturer have to be followed.

For all configurations:

The installation configuration shall be recorded within EASA form 123.

Note: The values of the quality indicators are consistent with the equivalent combinations described in FAA AC 20-165B.

4. Limitations

Any limitations defined by the equipment manufacturer apply.

An installation according to this SC cannot be used to claim compliance with CS-ACNS, Subpart D, Section 4 '1090 MHz Extended Squitter ADS-B Out installations'.

In the case of aircraft that are approved for NVISs/NVGs, if control/display panels are to be inserted, the change cannot be considered to be an SC.

5. Manuals

For configuration 1:

Amend the AFM with an AFMS to include a statement of compliance with AMC 20-24, as well as any necessary operating instructions, procedures or limitations.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required. In particular, include a check with content that is similar to the provisions of the latest revision of EASA SIB No.: 2011-15:

— at intervals defined and published by the competent authority, or

— at intervals defined in the latest revision of EASA SIB No.: 2011-15.

The ground test shall also include voluntarily transmitted ADS-B data (if any). This check satisfies the requirement for periodical maintenance that is referred to in AMC 20-24, Section 11.

For configuration 2:

Amend the AFM with an AFMS to include information on the quality indicators, as well as any necessary operating instructions, procedures or limitations.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required. In particular, include a check with content that is similar to the provisions of the latest revision of EASA SIB No.: 2011-15:

— at intervals that are defined and published by the competent authority, or

— at intervals that are defined in the latest revision of EASA SIB No.: 2011-15.

The ground test shall also include voluntarily transmitted ADS-B data (if any).

For configuration 3:

Amend the AFM with an AFMS to include information stating 'ADS-B OUT installation for airborne traffic awareness only' or similar information, together with any necessary operating instructions, procedures or limitations.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

Standard Change CS-SC034~~a~~b

EXCHANGE OF AN EXISTING BATTERY ~~BY~~ FOR A LITHIUM IRON PHOSPHATE (Li~~I~~Fe~~E~~PO$_4$) BATTERY~~IES~~ SYSTEM

1. Purpose

This SC is for the ~~E~~exchange of an existing battery~~ies by~~ for LiFePO$_4$ type battery~~ies~~ systems in aircraft.

This SC does not cover or replace the applicable regulations for the handling, storage, transport, ~~and~~ or disposal of batteries.

Note: This SC does not cover the installation of a battery ~~at~~ in a new location.

2. Applicability/Eligibility

This SC is applicable to ~~S~~sailplanes, including powered sailplanes.

3. Acceptable methods, techniques, and practices

— Before installation, a statement has to be available to ensure that ~~Acceptable standards for~~ the battery systems, batteries or the battery cells ~~test (performed and stated by the battery manufacturer)~~ are compliant at least with one of the following standards ~~has to be available~~:

- RTCA DO-347, Certification Test Guidance for Small and Medium Sized Rechargeable Lithium Batteries and Battery Systems; or
- RTCA DO-311A, Minimum Operational Performance Standards for Rechargeable Lithium Batteries and Battery Systems; or
- UL 1642, Standard for Lithium Batteries, or the equivalent; or
- UL 2054, Standard for Household and Commercial Batteries, or the equivalent; or
- UL 62133 Secondary Cells and Batteries Containing Alkaline or Other Non-Acid Electrolytes – Safety Requirements for Portable Sealed Secondary Cells, and for Batteries Made From Them, for Use in Portable Applications, or the equivalent; or
- UL 1973 Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications, or the equivalent; or
- IEC 62133-2 Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary lithium cells, and for batteries made from them, for use in portable applications, Part 2: Lithium systems, or the equivalent.

— For installation purposes, ~~the~~ FAA Advisory Circular AC 43-13-2B, Chapters 1 and 2, and FAA Advisory Circular AC 43.13-1B, Chapter 11, ~~are~~ contain acceptable data.

— Any ~~I~~impact on the weight and balance of the aircraft needs to be considered.

4. Limitations

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

— Starter batteries are not covered.

— The battery system shall have an integrated battery management system provided by the battery manufacturer.

— ~~The~~ Each installed battery system shall have a maximum capacity of 160 Wh.

— Any limitation defined by the battery system manufacturer applies.

5. Manuals

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

A ~~R~~release to service by the ~~P~~pilot-owner is acceptable only if the original battery mounting and connectors remain.

Standard Change CS-SC035a

INSTALLATION OF SOLAR CELLS ON SAILPLANES

1. Purpose

This SC is for the installation of solar cells on sailplanes for the purpose of allowing longer operation of the on-board battery system.

This SC does not cover solar cells that are used to recharge any batteries or energy storage systems for an electric propulsion system on a powered sailplane.

This SC does not cover the installation of batteries.

2. Applicability/Eligibility

This SC is applicable to ELA1 sailplanes, including powered sailplanes.

3. Acceptable methods, techniques, and practices

The following standards contain acceptable data for installation purposes:

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

— FAA Advisory Circular AC 43.13-1B, Chapter 11.

Additionally, the following conditions apply:

— The solar cells shall be located either in the area of the upper side of the fuselage between the tangential bolts that connect the wings to the fuselage, and/or on the doors of a retractable engine, if applicable. Typically, the solar cells are bonded to the surface with self-adhesive tape as described/specified by the solar cell manufacturer.

— Any holes that are required to route cables from the solar cells into the inner parts of the fuselage should not be larger than 6 mm in diameter, and special attention is required to prevent any chafing or short-cuts in these feedthroughs. If several holes are required for these feedthroughs, then the number of holes should be minimised.

— Special care is required to avoid damaging any bulkheads or stringers on the inside of the fuselage structure when drilling these holes.

— Seal any hole in the skin and in the solar panel to prevent any moisture penetration beneath the solar panels.

— The distance between the new holes and the cut-outs or other edges should comply with the aircraft manufacturer's guidance. In the absence of such guidance, a minimum of 100 mm should be considered.

— The electrical connection to the storage battery(ies) shall be installed according to the instructions of the solar cell charging system manufacturer, and shall:

- include a battery charge controller, to prevent overcharging of the storage battery(ies). If a lithium battery (or lithium batteries are) is installed, a battery management system is required;
- provide circuit protection (e.g. circuit breakers) against system overloads, and against smoke and fire hazards that result from intentional or unintentional system shorts, faults, etc.; and

- provide a clearly labelled 'on/off switch' for deactivating all the solar cells that is easily accessible by the pilot-in-command when in flight. As an alternative, a clearly labelled switch-rated circuit breaker may be used to also provide the circuit protection.

Note: The use of circuit breakers as switches is not acceptable as it can degrade their protection function, except for switch-rated circuit breakers, provided that they are shown to be appropriately rated for the number of switch cycles that are expected during the service life of the system or of the circuit breakers.

— After installation, perform a test to ensure that the flight control systems can move freely.

— Before the first operation in flight, a functional test of the system needs to be conducted on the ground with special attention paid to any possible overcharging or overheating of the system.

— Any impact on the weight and balance of the aircraft needs to be considered.

— Instructions and tests defined by the equipment manufacturer shall be followed.

4. Limitations

— If more than one battery will be charged, then all these batteries must have the same voltage and be of the same type and voltage (e.g. only lead-acid batteries running on 12 V).

— Any limitations defined by the solar cell and charging system manufacturer apply.

— Any limitations defined by the aircraft manufacturer apply (e.g. a limitation to install such solar cells onto a certain area on the surface of the sailplane).

— The installation of solar cells on structural parts such as the fuselage (i.e. not on the doors) is subject to the aircraft manufacturer not objecting to this installation.

— Solar cells must always be connected to the storage battery; direct power supply of flight instruments and ATC equipment is not allowed.

— The maximum power of the solar cells installed by means of this SC cannot exceed 40 W.

5. Manuals

Amend the AFM with an AFMS that contains or references the equipment instructions for operation, as required (e.g. Normal, Abnormal and Emergency Procedures for solar cell system power off).

Amend the ICAs to establish the required actions regarding the maintenance/cleaning/caring actions for the solar cells and charging system, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

Standard Change CS-SC036a

INSTALLATION OF VISUAL AWARENESS LIGHTS

1. Purpose

This SC is for the installation of visual awareness lights that are not certified as anti-collision lights and are not required by operational rules. These lights are typically high-intensity LEDs.

Due to their specialised purpose of helping pilots to avoid mid-air collisions, such light systems often have a limited field of coverage in the forward sector of the aircraft and/or they do not comply with the requirements as specified in the airworthiness requirements for aeroplanes (e.g. in CS-23).

Note: For the installation of anti-collision lights, refer to CS-SC032.

2. Applicability/Eligibility

This SC is applicable to ELA2 aircraft.

3. Acceptable methods, techniques, and practices

The following standards contain acceptable data for installation purposes:

— FAA Advisory Circular AC 43-13-2B, Chapters 1 and 2 are acceptable, and

— FAA Advisory Circular AC 43.13-1B, Chapter 11.

Additionally, the following conditions apply:

— Any impact on the weight and balance of the aircraft needs to be considered.

— For sailplanes, the visual awareness light systems shall be installed in one or more of the following locations:

- in the area of the upper/lower side of the fuselage between the tangential bolts that connect the wings to the fuselage;
- on the doors of a retractable engine;
- on the doors of the landing gear;
- on the nose of the aircraft;
- on the outer side of the wing tips;
- on the empennage;
- on top of the instrument panel;
- in the inside of the forward part of the canopy.

— For other aircraft, consider the conventional airframe locations for these lights.

— Typical installations are streamlined shapes that are mounted on the upper/lower side of the fuselage, the aircraft nose or wing tips, and devices that are installed on the inside of the canopy facing forward with provisions to not blind the pilot with the emitted light.

— For aircraft that only have storage batteries, the visual awareness light systems must be suitable for the voltage, power and type of these batteries.

— For aircraft with conventional power systems, an electrical load analysis has to be considered.

— Any holes that are required to mount the visual awareness light and the related route cables into the inner parts of the fuselage must not be larger than 6 mm in diameter. Special attention is required to prevent any chafing or short-cuts in these feedthroughs.

— If several holes are required for these feedthroughs, then these shall not be closer than 30 mm from each other, and the number of holes must be minimised.

— Special care is required to avoid damaging any bulkheads or stringers on the inside of the fuselage structure when drilling these holes.

— Follow the instructions of the visual awareness light manufacturer. Special care is required to prevent any possibility that the operating visual awareness light might blind the pilot or that the visual awareness light might hinder the forward vision of the pilot or any other aircrew on board, including reflections from the canopy/front windshield.

The design of the equipment installation must take into account crashworthiness, the arrangement and visibility of the installation, and any interference with other equipment.

Additionally, if the system is mounted in the inner side of the canopy or on the instrument panel, the design of the equipment installation must take into account the canopy jettison and the emergency exit.

— The electrical connection to the storage battery(ies) shall be installed according to the instructions of the visual awareness light system manufacturer, and shall:

- provide circuit protection (e.g. circuit breakers) against system overloads, smoke and fire hazards that result from intentional or unintentional system shorts, faults, etc.; and
- provide a clearly labelled 'on/off switch' for deactivating all visual awareness lights that is easily accessible by the pilot-in-command in flight. As an alternative, a clearly labelled switch-rated circuit breaker may be used to also provide circuit protection.

Note: The use of circuit breakers as switches is not acceptable as it can degrade their protection function, except for a switch-rated circuit breaker, provided that it is shown to be appropriately rated for the number of switch cycles that are expected during the service life of the system or of the circuit breaker.

— Before the first operation in flight, a functional test of the system has to be conducted on the ground with special attention to the possible blinding of the pilot or the overheating of the system.

— Instructions and tests defined by the equipment manufacturer shall be followed.

— For aircraft that are not limited to day VFR conditions, a placard shall be installed to limit the use of visual awareness lights to day VFR conditions only.

4. Limitations

— Visual awareness lights should be operated in day VFR conditions only and for situational awareness only.

— Any limitations defined by the visual awareness light system manufacturer apply.

— Any limitations defined by the aircraft manufacturer apply (e.g. a limitation to only install such visual awareness light on a certain area on the surface of the aircraft).

— This SC does not cover visual awareness light systems that require any modifications to parts of the wings (except wing tips) or to the empennage of the aircraft.

— The maximum number of visual awareness lights installed on each wing and the empennage is one on each.

5. Manuals

The AFMS shall, at least, contain:

— a description of the system, its operating modes and functionality;

— limitations, warnings and placards, as required; and

— the normal and emergency operating procedures.

Amend the ICAs to establish the required actions regarding the maintenance/cleaning/caring actions for the visual awareness light system, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

Standard Change CS-SC037a

EXCHANGE OF A MAIN AIRCRAFT BATTERY

1. Purpose

This SC is for the exchange of a main aircraft battery (e.g. starter battery, batteries for sailplanes) for another type that meets the same minimum standards.

This SC does not cover the installation of lithium batteries.

This SC does not cover the installation of a battery in a new location.

2. Applicability/Eligibility

This SC is applicable to aeroplanes and to rotorcraft that are not complex motor-powered aircraft, and to any ELA2 aircraft.

3. Acceptable methods, techniques, and practices

The following standard contains acceptable data for installation purposes:

— FAA Advisory Circular AC 43-13-2B, Chapters 1, 2 and 10.

Additionally, the following conditions apply:

— An acceptable standard for the battery or the test of the battery cells (performed and stated by the battery manufacturer) is:

- ETSO-C173A or later amendments, or the equivalent.

— Any impact on the weight and balance of the aircraft shall be considered.

— The new battery shall:

- feature a maximum power that is greater than or equal to the power of the replaced battery; and
- have a capacity that is greater than or equal to the capacity of the replaced battery.

4. Limitations

— Any limitations defined by the battery manufacturer apply.

— The regulations for the handling, storage, transport, and disposal of batteries apply.

— Batteries that are used for propulsion are not covered.

— Backup batteries that support essential systems such as avionics, or that are used for IFR, are not covered by this SC.

5. Manuals

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

This SC is suitable for the release to service of the aircraft by the pilot-owner.

Standard Change CS-SC038a

INSTALLATION OF DC TO DC CONVERTERS

1. Purpose

This SC is for installations of DC to DC converters to support avionics installations, equipment that require a power supply with a controlled voltage, and pilot devices.

This SC cannot be used where the converter is intended to power the following:

— aircraft systems that are necessary for continued safe flight and landing, or

— aircraft systems that are required to comply with airspace regulations.

2. Applicability/Eligibility

This SC is applicable to aeroplanes and to rotorcraft that are not complex motor-powered aircraft, and to 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, and

— FAA Advisory Circular AC 43.13-1B, Chapter 11.

Additionally, the following conditions apply:

— The DC to DC converters are authorised in accordance with ETSO-C71 or later amendments, or the equivalent.

— The installation of the DC to DC converters shall be protected by circuit protection (e.g. circuit breakers) against system overloads, smoke and fire hazards that result from intentional or unintentional systems shorts, faults, etc. The design of the equipment installation must take into account crashworthiness, the arrangement of the installation and any interference with other equipment.

— 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 that is installed in a location behind the occupant(s).

— The equipment is suitable for the environmental conditions to be expected during normal operation.

— The installation instructions and tests defined by the equipment manufacturer have to be followed.

— If multiple busbars are available, the DC to DC converter should be connected to the busbar that supports the criticality that is appropriate to the equipment that the converter supplies.

— If there are systems or equipment that are supplied by an essential power supply, i.e. systems or equipment that are necessary for continued safe flight and landing, an electrical load analysis or electrical measurements shall be undertaken. This analysis or measurement shall take into account the maximum loading that may be utilised from the PSS for the 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 the PED. This assessment shall be recorded in EASA Form 123.

— Perform an EMI test to assess any interference from the converter with other systems.

4. Limitations

Any limitations defined by the equipment manufacturer apply.

5. Manuals

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

Amend the AFM with instructions for operation, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

Standard Change CS-SC051~~b~~c

INSTALLATION OF 'FLARM' EQUIPMENT

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

1. Purpose

This SC is for the ~~i~~installation or exchange of FLARM® ~~Anti-Collision Awareness~~ traffic awareness and collision avoidance ~~S~~systems. These systems are ~~is~~ based on the specifications as defined by FLARM Technology ~~GmbH~~ Ltd.

Note: FLARM equipment ~~is not compatible with~~ is not equivalent to Transponder Mode A/C/S, ADS-B, Class A TABS or TCAS/ACAS equipment.

An aircraft that has only FLARM equipment installed will not be seen by air traffic control or by ACAS/TCAS systems.

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

This SC does not cover the installation of external antennas (see CS-SC004, which may be applied concurrently).

2. Applicability/Eligibility

This SC is applicable to 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~~.~~, and

— FAA Advisory Circular AC 43.13-1B, Chapter 11.

Additionally, the following conditions apply~~ies~~:

— The design of the equipment installation must take into account crashworthiness, the arrangement of the installation and its visibility, interference ~~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 that is installed ~~at~~ in a location behind the occupant(s).

— ~~A d~~Data bus/data connectivity between the FLARM device and other equipment which is:

- ETSO-authorised (or the equivalent); or
- required by the TCDS, AFM or POH; or
- required by other applicable requirements such as those for operations and airspace,
- ~~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 which the other equipment can 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.

— Fly the aircraft to assess the installation for satisfactory antenna coverage and identify ~~eventual~~ any possible limitations, by analysing data from the built-in flight recorder with the 'FLARM Range Analyzer' tool of FLARM Technology ~~GmbH~~ Ltd (available at www.flarm.com~~org~~).

Note: The above-mentioned flight is considered to be part of the SC installation activity, and it can be conducted without an individual Permit to Fly or any other certificate of release to service for the SC installation, as long as there is no other maintenance activity ongoing on the aircraft (i.e. other maintenance, which has not yet been released to service). The flight should be conducted by a pilot who understands~~~~ing~~* *the aircraft configuration (i.e. for an FLARM installation that has not yet been released to service). EASA Form 123 and the certificate of release to service for the installation of the SC should be issued after ~~assessing satisfactorily~~ the result provided by the FLARM range analyzer tool has been assessed and found to be satisfactory.*

4. Limitations

— The FLARM® based system cannot be used to substitute for any ~~A~~anti-~~C~~collision ~~D~~device that is mandated by the ~~EASA~~EU OPS rules for the intended operation ~~intended~~.

— ~~The system is not to be used in conjunction with night vision systems or in night or IMC conditions.~~ In the case of aircraft that are approved for NVIS/NVG, if control/display panels are to be inserted, the change cannot be considered to be an SC.

— Any limitations defined by the manufacturer of the FLARM® device are applicable. These must include periodical firmware and such database updates that are necessary for the intended function of the device.

5. Manuals

The AFMS shall, at least, contain:

— ~~the~~ a description of the system ~~description~~, its operating modes and its functionality;

— limitations, warnings and placards, at least, for the following:

- 'For situational awareness only',
- 'Use in day VFR ~~day~~ only';

— the normal and emergency operating procedures; and

— instructions for carrying out software and database updates.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the ~~P~~pilot-owner.

Standard Change CS-SC052~~b~~c

INSTALLATION OF GNSS EQUIPMENT

1. Purpose

This SC is for the ~~i~~installation ~~or exchange~~ of ~~a~~ GNSS equipment to enhance situational awareness. This could also include moving map GNSS-based functions.

This SC does not include the installation of external antennas (see CS-SC004, which may be applied concurrently).

For integrated systems that also provide~~ing~~ voice communications functionality and/or ~~a~~ VOR navigation capability, CS-SC052 may be applied concurrently with CS-SC001 and/or CS-SC056.

This SC does also not cover the connection of the GNSS equipment to any kind of AFCS, nor to an ADS-B OUT system.

2. Applicability/Eligibility

This SC is applicable to aeroplanes and to rotorcraft that are not complex motor-powered aircraft, and to any ELA2.

~~Non-pressurised aircraft with less than 2 721 kg (6 000 pounds) MTOM other than rotorcraft approved for NVIS~~.

3. Acceptable methods, techniques, and practices

The following standards contain~~s~~ acceptable data:

— FAA Advisory Circular AC 20-138D, including Change 1 and Change 2, Appendix 6, with the exception of paragraphs A6-4.c and A6-4.f.,

— FAA Advisory Circular AC 43-13-2B, Chapter 1 and 2~~.~~, and

— FAA Advisory Circular AC 43.13-1B, Chapters 11 and 12.

Additionally, the following conditions apply~~ies~~:

— ~~t~~The design of the equipment installation must take into account crashworthiness, the arrangement and visibility of the installation, and it should not interfere with any other equipment, the canopy jettison (if applicable), ~~and~~ or the emergency exit.~~;~~

— ~~d~~Data connectivity with the installed equipment and other equipment which is:

- required by the 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 that is being installed is explicitly listed by its manufacturer as compatible equipment to ~~be~~ which the other equipment can be connected ~~to~~.~~;~~

— ~~t~~The equipment is suitable for the environmental conditions to be expected during normal operation.~~;~~

— The instrument does not introduce any glare or reflections that could interfere with the pilot's vision. This condition applies to the instrument for all operations for which certification is requested.

— ~~t~~The equipment must be installed and tested in accordance with the equipment manufacturer's instructions.

4. Limitations

— The system is to be used for situational awareness under VFR only.

— The equipment installation cannot be used to extend the operational capability of the specific aircraft (e.g. from VFR to IFR).~~;~~

— All relevant integrated databases (e.g. for charts) must be current.~~;~~

— In the case of aircraft that are approved for NVIS/NVG, if control/display panels are to be inserted, the change cannot be considered to be an SC.

— Any limitations defined by the equipment manufacturer apply.

5. Manuals

The AFMS shall, at least, contain:

— ~~the~~a description of the system ~~description~~, its operating modes and its functionality;

— a limitations section that states ~~stating~~ the following:

'This equipment is to be used for situational awareness only', and

— the normal and emergency operating procedures. ~~; and~~

~~a~~Amend the maintenance manual with instructions for carrying out software and database updates.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the ~~P~~pilot-owner.

Standard Change CS-SC084a

REPAINTING OF COMPOSITE AIRCRAFT STRUCTURES

1. Purpose

This SC is for the repainting of the outer surfaces of composite aircraft with alternative varnishes of the acrylic or polyurethane paint types.

2. Applicability/Eligibility

This SC applies to ELA2 aircraft that have composite structures.

3. Acceptable methods, techniques, and practices

— Remove the old gelcoat or paint (e.g. by sanding down) and ensure that the resulting surface is adequate for the repainting (i.e. free of cracks, pinholes or voids, free of any grease or silicone or dust).

Note: Particular attention should be paid during the removal of the old gelcoat or paint to prevent any damage being caused by high temperatures.

— Inspect the structure in order to ensure that:

- the structure has not been damaged during the removal of paint; and
- all the repairs that are found have been made against the applicable repair instructions.

— The paint manufacturer's instructions and safety information shall be observed.

— After each renewal of the coat of paint, a weight and balance check of the aircraft must be completed; in particular, it shall be assured that the weight and the residual moments of the control surfaces are within acceptable limits.

— Respect/replicate any mandatory placards or markings.

4. Limitations

— Any limitations defined by the paint manufacturer apply.

— Any limitations defined by the aircraft manufacturer apply (e.g. a limitation to a white surface colour and/or limits to the mass balancing [the weight and moment] of any control surface). In the absence of any manufacturer's indications regarding the acceptable colours, only the original colour or the white colour should be considered.

5. Manuals

Amend the ICAs to establish the required actions regarding the maintenance/cleaning/caring actions for the new outer surface, as required, referring to the paint manufacturers' maintenance and repair instructions.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

Standard Change CS-SC085a

EXCHANGE OF AN AIRCRAFT LIVERY PAINT AND DECORATIVE STICKER SCHEME

Purpose

This SC is for a full or partial exchange of the design of the external livery of an aircraft.

1. Applicability/Eligibility

This SC applies to aeroplanes and to rotorcraft that are not complex motor-powered aircraft, and to any ELA2 aircraft.

2. Acceptable methods, techniques, and practices

(a) Paint/sticker materials to be used: by default, only materials (e.g. primer, filler, top coat, gelcoat, decorative adhesive sticker, etc.) that have been approved to be used on a given aircraft through the existing applicable maintenance data (e.g. the AMM, supplemental maintenance manual, or any other ICAs that are applicable to the aircraft) shall be used.

If some or all of the materials listed in the existing ICAs are either no longer available (obsolete) or not compliant with the applicable environmental protection requirements, then the following two options apply:

— the use of alternate materials shall be approved in accordance with Part 21, or

— materials may be used if they have been declared by the materials' manufacturer(s) to be equivalent to the materials listed in the existing ICAs.

(b) Application processes for paint/sticker materials: any application processes/techniques that were approved by the TC/STC holder through the applicable maintenance data (e.g. the AMM, the SMM, or the equivalent ICAs) shall be followed.

Otherwise, the application processes/techniques that were documented and published by the manufacturer of the materials shall be followed.

In any case, the aircraft pre-painting preparation tasks and the final checks (bounding, balance, etc.), if any, that were defined by the TC/STC holder shall be followed.

Note: Particular attention must be paid to not cover static ports, fuel vents, drainage and similar openings.

(c) Design of the external livery: when defining the design of the external livery, the following must be considered:

(1) Markings: each emergency exit and external door (if any) in the passenger compartment must be externally marked and readily identifiable from outside the aeroplane by:

— a conspicuous visual identification scheme; and

— a permanent decal or placard on or adjacent to the emergency exit that shows the means of opening the emergency exit, including any special instructions, if applicable. Each placard and operating control for each emergency exit must be red in colour.

(2) Fuel filler openings must be marked at or near the filler cover with:

— for reciprocating engine-powered aircraft:

- the word that identifies the correct type of fuel, e.g. 'Avgas', 'MOGAS', 'Diesel', 'Jet Fuel', as applicable; and
- the minimum fuel grade;

— for turbine engine-powered aircraft:

- the word that identifies the correct type of fuel, e.g. 'Jet Fuel', as applicable; and
- the permissible fuel designations, or references to the AFM for permissible fuel designations;

— for pressure fuelling systems, the maximum permissible fuelling supply pressure and the maximum permissible defuelling pressure.

(3) Oil filler openings must be marked at or near the filler cover with:

— the word 'Oil'; and

— the permissible oil designation, or references to the AFM for permissible oil designations.

(4) Coolant filler openings must be marked at or near the filler cover with the word 'Coolant'.

(5) The system voltage of each direct current installation (if any) must be clearly marked adjacent to its external power connection.

(6) Every external marking/placard (including the aircraft registration marks) must have a colour contrast that is readily distinguishable from the surrounding surface.

(7) After the painting or application of decorative stickers, every placard that was originally installed as per the aircraft ICAs or AFM shall be reinstalled and verified for proper readability.

(d) Slip-resistant surfaces

(1) If any areas of the aircraft are already covered with slip-resistant material (e.g. the upper surface of the wing root), those areas must either remain untouched or identical areas of the slip-resistant material approved by the TC or STC holder can be reinstalled following the embodiment of the new paint scheme.

(2) Using this SC, the areas that are covered with slip-resistant material shall not be enlarged, and no such areas shall be added to an existing design. Any enlargement of, or addition to, the areas covered with slip-resistant material shall be approved in accordance with Part 21.

(e) Weight and balance

(1) Emphasis is directed to the effect of too many extra coats of paint on the general weight and balance of an aircraft, and more particularly regarding balanced control surfaces. Adding additional coats of paint in excess of what the TC or STC holder originally applied in accordance with existing applicable maintenance data must be avoided. Where available, the TC or STC holder's instructions relative to the finishing and balance of control surfaces must be consulted and followed.

(2) If the design change involves the painting of the complete aircraft (or extensive use of decorative stickers), then after the completion of the painting, the aircraft must be weighed in accordance with the TC holder's applicable maintenance data. The aircraft weight and balance report shall be updated accordingly.

3. Limitations

Any limitations defined by the TC or STC holder apply.

If materials have been used that are not listed in the existing ICAs, any limitations defined by the manufacturers of the materials apply.

4. Manuals

Amend the ICAs to include a clear and complete description of the external livery paint scheme. It is recommended that this description should take the form of a drawing that includes:

— the overall design, including the dimensions and details of any painted markings;

— the paint/decorative sticker reference(s) and colour(s); and

— the type, serial number and registration of the aircraft to which the drawing belongs.

Notes:

- If materials have been used that are not listed in the existing ICAs, proof from the manufacturer of the materials that the materials used are considered to be equivalent to the materials listed in the existing ICAs must be recorded as part of the aircraft records.
- If application processes/techniques have been used that are not documented in the applicable maintenance data (the AMM, the SMM, or the equivalent ICAs), the documented application processes/techniques of the manufacturer of the materials must be recorded as part of the aircraft records.

5. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

Standard Change CS-SC086a

EXCHANGE OF A BALLOON 'BOTTOM-END'

1. Purpose

This SC is for the replacement of a complete bottom-end with a different one that is part of the type certificate of another approved balloon.

A complete bottom-end comprises the basket, the burner frame, the burner, the fuel cylinders and the fuel hoses of a single manufacturer.

Note: In a balloon, the envelope identifies the aircraft registration, the type certificate and the serial number. Changing the bottom-end is considered to be a modification to the aircraft type design, i.e. it results in a modified balloon. The certificate of airworthiness, the aircraft flight manual, the aircraft logbook, etc., belong to the modified balloon (i.e. they 'remain' with the envelope).

2. Applicability/Eligibility

This SC is applicable to hot-air balloons, as defined in ELA1, which are used in non-commercial operations.

3. Acceptable methods, techniques, and practices

The following considerations apply:

— The maximum take-off mass of the modified configuration shall not be greater than the original one. Consider limiting factors like bottom end payload and burner performance.

— The minimum landing mass of the modified balloon must be greater than or equal to the approved minimum landing mass of the original balloon. If the minimum landing mass is not defined, a good estimate is $\frac{150\ kg}{1\ 000\ m^3}$.

— The performance of the burner must be adequate for the size of the envelope. Guidance on the adequacy of the performance of the burner can be derived from the TCDS.

— If the dimensions of the basket (width to length) exceed the proportions of 1 to 1.3, the envelope must be equipped with turning vents.

— The number of attachment points for the basket wires in the original configuration must be the same as in the new configuration after the exchange.

— The means of attachment of the flying wires must be the same as in the original configuration (e.g. replace carabiners with carabiners, shackles with shackles).

— The burner frame geometry regarding the position of the attachment points must be congruent (same dimension in x and y direction, in the same plane).

— If a bottom-end from manufacturer A is combined with an envelope from manufacturer B, then:

- check that the geometry of the attachment points of the bottom-end from manufacturer A is identical to the geometry of the attachment points of the burner frame from manufacturer B, as referenced in the flight manual of manufacturer B for the selected envelope;
- a tolerance of maximum 25 mm between the two attachment points is acceptable.

— The owner is responsible for the continued airworthiness of the changed configuration.

— The aircraft maintenance programme must be amended according to the new configuration.

— The equipment list must be amended in accordance with AMC M.A.801 to record all parts of the new configuration.

4. Limitations

— All parts must be included in an EASA-approved type design.

— All parts must be accompanied by an EASA Form 1, or an equivalent airworthiness certificate, or be listed in the equipment list associated with a valid airworthiness review certificate.

— Any limitations defined by the manufacturers of the bottom-end and the envelope apply.

— Modifications to the flying wires, e.g. lengthening or shortening of the wires and their attachments, is prohibited, unless defined in the ICA by the TC holder.

5. Manuals

The flight manual of the modified configuration must be supplemented by manufacturer-specific information of the bottom-end and should contain, at least, the following:

— a description of the system, its operating modes and its functionality;

— the limitations and warnings;

— the emergency and normal operating procedures; and

— the ICAs.

6. Release to service

This SC may be released by the pilot-owner subject to compliance with AMC M.A.801.

Standard Change CS-SC105a

INSTALLATION OF MOUNTING SYSTEMS TO HOLD EQUIPMENT

1. Purpose

This SC is for the installation of 'mounting systems' that are intended to hold pilot's equipment inside the cockpit or the cabin. This SC only addresses the mechanical installation.

Note: This SC does not apply to hand-held carry-on cameras, nor to devices worn by the pilot, e.g. helmet-mounted cameras.

2. Applicability/Eligibility

This SC is applicable to ELA2 aeroplanes.

3. Acceptable methods, techniques, and practices

For the purpose of this SC, the following definitions apply:

— 'installer' means the person who releases the aircraft to service in accordance with AMC M.A.801 (and who carries out this SC);

— 'mounting system' means the structural provisions such as suction mounts, brackets, clamps or any attachments which are fastened or bonded and installed in the aircraft through this SC;

— 'equipment' means the equipment that is used and installed by the pilot on the mounting system defined above in accordance with the data established and released by the installer; and

— 'unit' means the 'equipment' plus the 'mounting system'.

Installation conditions:

— If the unit is fitted in or near the cockpit, it must not interfere with any cockpit controls, nor obstruct the pilot's view of the instruments, or the pilot's external view, and it must not cause a distraction.

— The mounting system must be installed on one of the fixed surfaces of the aircraft, i.e. not on any control system components that are subject to motion. There must be no interference with the flight controls.

— Where brackets, clamps and/or attachments are used, care must be taken to ensure that they do not damage the aircraft structure that carries flight loads.

— If existing airframe structural fastener locations are picked up, then any additional installed brackets of the mounting system should be of the same material as the underlying structure, and the new attachment bolts will need to be of sufficient length to maintain safety and to maintain suitable thread engagement and protrusion. However, it should be ascertained that no external or internal parts or systems, including the flight controls, could be fouled or obstructed by employing longer fasteners. Note that no part of the mounting system should be introduced that acts as a packer between any major load paths, e.g. where a bracket would act as a washer under the bolt head or nut, the size of the bolt should be taken into consideration, and all disturbed fasteners must be inspected prior to the release to service of the aircraft by the installer.

— If suction mounts are used inside the cockpit or cabin, a suitable secondary retaining lanyard or strap should be attached to the unit to prevent any damage or a control jam if the primary suction mount becomes detached.

— The equipment that is mounted on the holding structural provisions in occupied areas should be installed so as to meet the requisite crash load requirements so that they will not detach, or become loose and cause injury to the occupants during operation or in the event of an emergency landing.

— For suction mountings, the primary suction mounting and secondary lanyard/strap should be assessed so that each is independently capable of carrying the load.

— Push/Pull test requirement: the equipment should be weighed prior to installation and checked to ensure that the total unit mass does not exceed 300g. Installers are advised to record the mass of the mounting system in a visible area.

— In order to check the security of the mounting system in flight, ground and emergency landing cases, a spring balance or another suitable method should be used to independently apply loads to the mounted unit of at least:

- 9 times the weight of the unit forwards,
- 4.5 times the weight of the unit upwards,
- 6 times the weight of the unit downwards,
- 3 times the weight of the unit to port,
- 3 times the weight of the unit to starboard.

Loading should be applied for at least 3 seconds with no failures, damage or permanent deformation. Higher load factors should be considered to be appropriate for aerobatic use and should include a downwards case of 9 times the weight of the unit.

— When a suction mount is used, pull testing should be used to confirm the integrity of the secondary retention to at least 10 times the weight of the unit. Periodic rechecking of the primary mount integrity is advised.

— Proprietary self-adhesive mounts can be used in accordance with the manufacturer's instructions provided that they are capable of passing the pull tests. Installation of a secondary independent lanyard/strap retention feature may also be considered to be prudent when using these types of mounts.

Additionally, the following considerations apply:

— As part of applying this SC, the installer shall:

- define and record the locations where the mounting systems can be installed on the individual aircraft, ensuring that the installation does not impede the rapid evacuation of the occupants; and
- list the acceptable and tested mounting systems, their weights, and the part numbers or other means by which they are identifiable.

— In the particular case of balloons and rotorcraft, pull tests shall:

- be performed on all locations where a camera can be installed; and
- be performed in all possible landing directions, including vertically downwards (-z).

— No items with sharp edges shall be installed in close proximity to the head of any occupant.

4. Limitations

— Any limitations defined by the equipment manufacturer apply.

— The total mass of the unit shall not exceed 300 g.

5. Manuals

Amend the AFM to reference the instructions for operation and the mass of the mounting system, as required.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required. There is a concern that self-adhesive mounts may be subject to environmental deterioration, especially for installations that are used over long periods. Therefore, periodic inspections on the whole mounting system shall be mandated and, if there are signs of deterioration, a pull test of the strength and integrity of the unit shall be performed. Parts that show signs of deterioration must be rectified or replaced.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

Note: Any mounting of an installation on the aircraft in accordance with the AFM/AFMS is not considered to be a maintenance action according to Part-M, and does not require a release to service.

Standard Change CS-SC106a

INSTALLATION OF FLIGHT TIME RECORDERS

Note: Flight time recorders record the flight time, engine time, take-offs and landings, or a combination of them, for the purpose of creating logbook entries, and for accounting. Flight time recorders that are subject to this SC are not required to be in compliance with ETSO-2C197 or equivalent standards.

Subject to the conditions of point 21.A.307(c) of Annex I (Part 21) to Regulation (EU) No 748/2012, they may be installed without EASA Form 1.

1. Purpose

This SC is for the installation of flight time recorders without affecting any aircraft systems or installing any new data acquisition points.

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

This SC does not cover the installation of external antennas (see CS-SC004, which may be applied concurrently).

2. Applicability/Eligibility

This SC is applicable to ELA2 aircraft.

3. Acceptable methods, techniques, and practices

The following standard contains acceptable data:

— FAA Advisory Circular AC 43-13-2B, Chapters 1, 2, 11 and 12.

Additionally, the following conditions apply:

— The design of the equipment installation must take into account crashworthiness, the arrangement and visibility of the installation, any interference with other equipment, the jettison of the canopy, 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 that is installed in a location behind the occupant(s).

— Data bus/data connectivity between the flight time recorder and any other equipment that is ETSO-authorised or approved in accordance with point 21.A.305 is not allowed.

— The equipment must be suitable for the environmental conditions that are to be expected during normal operation.

— Instructions and tests defined by the equipment manufacturer have to be followed.

— Perform an EMI test to assess any interference by the flight time recorder with other systems, provided that the flight time recorder emits transmissions during flight.

— The mounting system may be installed by following the provisions of CS-SC105.

Note: Lightweight in-flight recording systems may encompass the information collection and monitoring systems that are specified in ETSO-2C197. However, in-flight recording systems are not required to be compliant with ETSO-2C197.

4. Limitations

— Any limitations defined by the manufacturer of the flight time recorder apply.

— The flight time recorder cannot be used as a substitute for the logbook record requirements that are mandated by Commission Regulation (EU) No 965/2012[2] and Commission Regulation (EU) No 1178/2011[3] (e.g. points CAT.GEN.MPA.180, FCL.130.S, FCL.710, FCL.720 and FCL.135.A).

— GSM, UMTS, LTE, or similar transmission functions whose output power is unknown or is greater than 100 mW shall be switched off during flight.

— The embodiment of this SC cannot affect any other aircraft systems or involve the installation of any new data acquisition points.

5. Manuals

— Amend the AFM with an AFMS that contains or references the equipment instructions for operation and any reference to the applicable limitations (refer to paragraph 4 above), as required.

— Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

[2] Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R0965&from=EN).

[3] Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 311, 25.11.2011, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1524553458669&uri=CELEX:02011R1178-20160408).

Standard Change CS-SC107a

INSTALLATION OF CARBON MONOXIDE DETECTORS

1. Purpose

This SC is for the installation of CO detectors, either as panel-mounted devices or by a semi-permanent installation of 'lifesaver' badges by the use of adhesives.

The exchange of CO detectors that were installed as part of the type design or other approved installations is not covered by this SC.

Note 1: If the installation requires additional brackets, please also refer to CS-SC105, which may be applied concurrently.

Note 2: CO is a toxic, odourless and tasteless gas produced by the incomplete combustion of fossil fuels. Dangerous levels of CO can be produced by internal combustion engines or by any poorly vented or improperly adjusted fuel-burning appliances. Exposure to CO may cause sickness, headaches, or even death. CO detectors can save a pilot's life.

2. Applicability/Eligibility

This SC is applicable to aeroplanes and to rotorcraft that are not complex motor-powered aircraft, and to any ELA2 aircraft.

3. Acceptable methods, techniques, and practices

For the purpose of this SC, the following definitions apply:

— 'installer' means the person who releases the aircraft to service in accordance with AMC M.A.801 (and who carries out this SC);

— 'panel-mounted´ means that 'spare, free' panel holes in the cockpit are used for the mounting;

— 'unit' means the 'detector' plus the 'mounting system'.

Installation conditions:

— If the unit is fitted in or near the cockpit, it must not interfere with any cockpit controls, and not obstruct the pilot's view of the instruments, or the pilot's external view, or cause a distraction.

— The mounting system must be on the fixed surfaces of the aircraft, i.e. not on any control system components that are subject to motion. There must be no interference with the flight controls.

— Where brackets, clamps and/or attachments are used, care must be taken to ensure that they do not damage the aircraft structure that carries flight loads.

— The equipment that is mounted on the holding structural provisions, other than for CO badges in occupied areas, should be installed so as to meet the requisite crash load requirements so that the equipment will not detach or become loose and cause injury to the occupants. For such installations, CS-SC105a should be followed, including the push/pull test requirements.

— The equipment manufacturer's installation instructions and testing provisions, if any, have to be followed.

— For self-adhesive CO badge detectors:

- as they normally are required to be replaced after a certain time in operation, the installation of a backplate is recommended, as the adhesive may interfere with the aircraft structure; and
- the installer should record the expiry date of the detector, if any, in EASA Form 123, or in the technical logbook.

Additionally, the following considerations apply:

— As part of applying this SC, the installer shall:

- define and record the location of the CO detector on the aircraft; and
- list the acceptable and tested mounting system, its weight, and if it is not a CO badge, the part number or similar identification.

4. Limitations

— Any limitations defined by the equipment manufacturer apply.

— The maximum mass of the unit shall not exceed 300 g.

5. Manuals

— Amend the AFM to reference the operating instructions and the mass of any panel-mounted detectors, as required.

— Amend the ICAs in order to:

- establish recurrent inspections to monitor the condition of the unit by checking the integrity and security of the mounting system. Parts that show signs of deterioration must be rectified or replaced; and
- establish discard intervals if they are required by the manufacturer.

6. Release to service

The first installation of a CO detector is not suitable for a release to service of the aircraft by the pilot-owner.

A pilot-owner can replace CO detection badges by following the AFMS instructions.

Standard Change CS-SC151~~a~~b

INSTALLATION OF HEADRESTS

1. Purpose

A significant portion of the existing sailplane and powered-sailplane fleet is not equipped with headrests as required by the newer certification specifications. The intention of this SC is to enable the simple adaption and installation of headrests and backrests with integrated headrests that are available for similar designs using established practices.

2. Applicability/Eligibility

This SC is applicable to ~~S~~sailplanes ~~and~~ including powered sailplanes as defined in ELA2.

3. Acceptable methods, techniques, and practices

— The headrest and its parts are installed and manufactured according to the design data in compliance with CS 22.788 'Headrests'.

— Modified attachments are assessed or tested against the loads referred to in CS 22.788.

— Any ~~I~~interference with controls needs to be assessed, and this also applies for the empty seat in the case of a two-seater.

— Adaptions are made using established repair practices, as described in:

- the maintenance or repair manual;
- 'Kleine Fiberglas Flugzeug Flickfibel' by Ursula Hänle[4]; and
- FAA AC 43.13-2B/1B.

4. Limitations

N/A~~a~~

5. Manuals

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

6. Release to service

This SC is not suitable for the release to service of the aircraft by the ~~P~~pilot-owner.

[4] Available under http://www.dg-flugzeugbau.de/flickfibel-d.html. Also available in English under the title 'Plastic Plane Patch Primer'.

Standard Change CS-SC152~~a~~b

CHANGES TO SEAT CUSHIONS INCLUDING THE USE OF ALTERNATIVE FOAM MATERIALS

1. Purpose

This SC is for the ~~I~~installation of alternative materials in the construction of ~~the~~ seat cushions. For the refurbishment of seats with new seat cushions, alternative foam materials can be used.

2. Applicability/Eligibility

This SC is applicable to ~~A~~aeroplanes ~~not being complex motor-powered aircraft,~~ and to rotorcraft that are not ~~being~~ complex motor-powered aircraft, and to any ELA2 aircraft.

This SC is not applicable for installations in/on dynamically tested seats (according to CS 23.562, CS 23.2270 or equivalent).

Note: In cases of uncertainty, check with the TC or STC holder.

3. Acceptable methods, techniques, and practices

(a) The following standard contains acceptable data:

— FAA Advisory Circular AC 23-2A, Change 1.

(b) Seat cushions can be changed, including using new materials, under the following conditions:

(1) The design of exchange seat cushions should follow the geometrical dimensions of the original seat cushions.

(2) If the geometrical dimensions are altered, it must be ensured that access to and egress from the seat will not be altered. On pilot seats, it must be ensured that the new cushion has no influence on the use of any of the controls.

(3) The 'flame-resistant' capability of the material installed on aircraft other than sailplanes, motor-powered sailplanes, LSAs, and balloons must be demonstrated. The 'flame-resistant' capability can be demonstrated by:

(i) compliance with the 'flame-resistance' requirements proven by means of FAA AC 23-2A Change 1 §8 b, or the equivalent, and documented by appropriate test reports released by the material suppliers; or

(ii) compliance with any other more stringent flammability tests (e.g. the vertical tests of FAR/CS-25 Appendix F); or

(iii) the successful execution of the following 'Flame Resistant' test, referenced or recorded in EASA Form 123:

'Flame Resistant' test

(A) Test specimens. Three specimens, approximately 4 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 2 inches wide and 13 inches long, with the free end at least 0.5 inches from the end of the frame for ignition purposes. In the case of fabrics, the direction of the weave that corresponds 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 draught-free conditions. The surface that will be exposed, when installed in the aircraft, should face downwards 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-mentioned 4-inches-per-minute burn rate.)

~~For aeroplanes, all materials used in the construction of seat cushions must be flame resistant. Flame resistance can be demonstrated according to FAA Advisory Circular AC 23-2A, or, alternatively, such materials must pass the flammability test according to Appendix F, Part I of CS-25 (see FAA Advisory Circular AC 23-17C, paragraph 23.853). Each material used in the construction of seat cushions must meet the above flammability tests separately.~~

~~Materials (including foam materials) that will be used in sailplanes or powered sailplanes do not have to meet flammability requirements.~~

To improve occupant safety, it is recommended to use energy-absorbing foams in the construction of seat cushions. Energy-absorbing foam materials have the potential to reduce the possibility of spinal~~e~~ injuries in case~~s~~ of hard landings or minor crash landing~~s~~.

~~Additionally, the following applies:~~

- ~~The design of exchange seat cushions should follow the geometrical dimension of the original seat cushion.~~
- ~~In case the geometrical dimensions are altered, it must be ensured that access to and egress from the seat will not be altered. On pilot seats, it must be ensured that the cushion has no influence on the use of any of the controls.~~

4. Limitations

N/A~~a~~

5. Manuals

N/A~~a~~

6. Release to service

This SC may be released by the ~~P~~pilot-owner subject to compliance with AMC M.A.801 ~~and only~~ in the case of sailplanes, ~~and~~ including powered sailplanes.

Standard Change CS-SC201~~a~~b

EXCHANGE OF POWERPLANT INSTRUMENTS

1. Purpose

This SC is for the ~~E~~exchange of powerplant instruments ~~with~~ for new ones, and it is applicable to:

— temperature instruments;

— fuel and oil quantity instruments;

— fuel flowmeters;

— manifold pressure instruments;

— tachometers (rpm~~RPM~~);

— pressure instruments; and

— carbon monoxide detector instruments.

This SC does not permit the installation of digital multifunction displays.

2. Applicability/Eligibility

This SC is applicable to ~~P~~piston-engined aeroplanes with MTOMs ~~below~~ of less than 2 730 kg, and to ELA2 aircraft.

3. Acceptable methods, techniques, and practices

The following standard~~s~~ contains acceptable data:

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

Additionally, the following conditions apply~~ies~~:

— ~~t~~The instrument is authorised according to the applicable ETSO~~/JTSO~~ or the equivalent.~~;~~

— ~~t~~The instrument has the same minimum functionality, is installed ~~at the same~~ in a similar location, and is compatible with the existing installation.~~;~~

— The display of information is consistent with the overall flight deck design philosophy.~~;~~

— ~~t~~The instrument is suitable for the environmental conditions to be expected during normal operation.~~;~~

— ~~t~~The indicators have the ~~required~~ markings (e.g. limits, operating ranges) that were required on ~~of~~ the original instrument.~~;~~

— The 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.~~;~~

— The instructions and tests defined by the instrument manufacturer have to be followed.~~; and~~

— ~~t~~The instrument should provide the measurement of the related magnitude in the same units as the ~~exchanged~~ instrument for which it was exchanged, or in 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 the AFM with an AFMS that contains~~ing~~ or references~~ing~~ the operating instructions for the instrument~~'s instructions for operation~~, as required.

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

6. Release to service

This SC is not suitable for the release to service of the aircraft by the ~~P~~pilot-owner.

Standard Change CS-SC206a

EXCHANGE OF FIXED-PITCH WOODEN PROPELLERS

1. Purpose

This SC is for the exchange of a fixed-pitch wooden propeller for a similar fixed-pitch wooden propeller.

2. Applicability/Eligibility

This SC is applicable to ELA2 aeroplanes with fixed-pitch wooden propellers.

3. Acceptable methods, techniques, and practices

The following standards contain acceptable data:

— The propeller manufacturer's installation instructions and testing, if any, have to be followed.

Additionally, the following conditions apply:

— The number of blades, the mass, speed, diameter, gradient, twist, cord and tip shape, but also such main parameters as the centring hole, pitch circle diameter, and the number and diameter of the mounting bolts of the new propeller must be the same as those of the original propeller or must be permitted by the following Table 1 'maximal tolerances' of the original propeller.

Parameter	Tolerance	Remarks
Mass	± 10 %	
Rotational speed	+ 0 /– 50 rpm	
Diameter (R)	+0 / – 2 cm	Related to design data
Pitch	+ 0 / – 10 cm	
Cord, Twist	± 5 %	Each over the length of the propeller
Tip shape	Rounded or squared	Change from squared to rounded is allowed

Table 1 — Maximal tolerances

— The new propeller shall be type-certified by EASA, i.e. listed on the EASA Propeller Product List.

— A reissue of the noise certificate (EASA Form 45) by the competent authority is required.

The installer has to coordinate with the EASA Noise Department to ensure that the Noise Database is updated by sending the following information to noise@easa.europa.eu:

— the designation of the propeller,

— its diameter, and

— its pitch.

On EASA Form 45, state under 'Remarks': 'Propeller similarities demonstrated in accordance with CS-SC206a.'

4. Limitations

Any limitations defined by the propeller manufacturer apply.

5. Manuals

Amend the AFM with an AFMS that contains or references the operating instructions for the propeller, as required.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the pilot-owner.

Standard Change CS-SC207a

EXCHANGE OF THE FUEL CYLINDERS ON HOT-AIR BALLOONS

1. Purpose

This SC is for the exchange of hot-air balloon fuel cylinders.

2. Applicability/Eligibility

This SC is applicable to hot-air balloons as defined in ELA2, which are used in non-commercial operations.

3. Acceptable methods, techniques, and practices

The following considerations apply:

— The new fuel cylinder must be part of an EASA-approved balloon type design.

— The installation must take into account the approved configuration in accordance with the respective FM.

— The installation must take into account any interference with other equipment.

— The design of the equipment installation must take into account the structural integrity of the attachment point. Therefore, the new cylinder must be similar in length to, and not heavier than, the one that was originally approved.

— The owner is responsible for the continued airworthiness of the changed configuration, and the aircraft maintenance programme must be amended to include the new fuel cylinder(s).

— The equipment list must be amended in accordance with AMC M.A.801 to record the new fuel cylinder(s).

It is recommended to equip the fuel cylinders with quarter-turn ball valves as described in EASA SIB No.: 2018-14.

4. Limitations

— The fuel cylinder must be accompanied by an EASA Form 1, or an equivalent airworthiness certificate, or be listed in the equipment list associated with a valid airworthiness review certificate.

— Any limitations defined by the fuel cylinder manufacturer apply.

— The new fuel cylinder must be compatible with the existing fuel hose connectors.

— Modifications to the fuel cylinder or the fuel system are not permitted.

5. Manuals

The FM Supplement must, at least, contain:

— a description of the system, its operating modes and its functionality;

— the limitations and warnings;

— the normal and emergency operating procedures; and

— the ICAs.

The instructions of original equipment manufacturer for the exchanged fuel cylinder, for continued airworthiness, and for airworthiness limitations, remain applicable and must be applied.

6. Release to service

This SC may be released by the pilot-owner subject to compliance with AMC M.A.801.

Standard Change CS-SC401~~b~~c

EXCHANGE OF BASIC FLIGHT INSTRUMENTS

1. Purpose

This SC is for the ~~E~~exchange of basic flight instruments ~~with~~ for new equipment, and it is applicable to:

— airspeed instruments;

— turn and slip instruments;

— bank and pitch instruments;

— direction instruments;

— vertical velocity instruments; ~~and~~

— accurate time pieces (e.g. clocks); and

— pressure-actuated altimeter instruments.

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

2. Applicability/Eligibility

This SC is applicable to ~~A~~aeroplanes that are not ~~being~~ complex motor-powered aircraft, to any ELA2 aircraft with a maximum flight altitude below FL 280, and to sailplanes, including powered sailplanes ~~or balloons being ELA2 aircraft with a maximum flight altitude below FL 280~~.

It is also applicable to ~~R~~rotorcraft that are not ~~being~~ complex motor-powered aircraft, which have a ~~with~~ single ~~piston~~ engine, and which are limited to day VFR ~~day~~ only.

In the case of rotorcraft, ~~if the rotorcraft is approved for NVIS, the change cannot be considered an SC;~~ if the instrument is to be connected ~~with~~to the AFCS, the change cannot be considered to be an SC.

3. Acceptable methods, techniques, and practices

The following standard~~s~~ contains acceptable data:

— FAA AC 43-13-2B, Chapter 11.

Additionally, the following conditions apply~~ies~~:

— With the exception of clocks, the instrument is authorised according to the applicable ETSO~~/JTSO~~ or the equivalent.~~;~~

— ~~t~~The instrument has the same functionality, is installed ~~at~~in the same location, and the display of information is consistent with the overall flight deck design philosophy.~~;~~

— ~~t~~The instrument is suitable for the environmental conditions to be expected during normal operation.~~;~~

— The instrument does not introduce any glare or reflections that could interfere with the pilot's vision. This condition applies to the instrument for all operations for which certification is requested.

— ~~t~~The indicators have the ~~required~~ markings (e.g. limits, operating ranges) that were required on ~~of~~ the original instrument.~~;~~

— The 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.~~;~~

— The instructions and tests defined by the equipment manufacturer have to be followed.~~; and~~

— ~~t~~The new instrument should provide the measurement of the related magnitude in the same units as the instrument for which it was exchanged ~~instrument~~, or in 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.

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

5. Manuals

Amend the AFM with an AFMS that contains~~ing~~ or references~~ing~~ the operating instructions for the instrument~~'s instructions for operation~~, as required.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

This SC is not suitable for the release to service of the aircraft by the ~~P~~pilot-owner.

SUBPART C — STANDARD REPAIRS

LIST OF STANDARD REPAIRS

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

CS-SR802~~b~~c — Repair of sailplanes including powered sailplanes, LSA and VLA

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

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

Standard Repair CS-SR802~~b~~c

REPAIR OF SAILPLANES INCLUDING POWERED SAILPLANES, LSA AND VLA

1. Purpose

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

2. Applicability/Eligibility

This SR is applicable to ~~S~~sailplanes, including 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[5], ~~and~~or

— Seminardruck 'Faserverbundwerkstoffe im Segelflugzeugbau', Fortbildungsseminar des DAeC;

for wooden and mixed structures on sailplanes including powered sailplanes:

— R.C. Stafford-Allen 'Standard Repairs to Gliders' by the British Gliding Association[6], 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'[7], issued by Federation Francaise de Vol a Voile[8];

for general purposes:

— 'Grundlagen der Luftfahrzeugtechnik in Theorie und Praxis', Band II Verlag TÜV Rheinland GmbH, ISBN Nr.: 3-88585-001-X, or

— 'Grundlagen der Luftfahrzeugtechnik in Theorie und Praxis', Band V: Segelflugzeuge und Motorsegler, Verlag TÜV Rheinland GmbH, ISBN Nr.:3-8249-0351-2.

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 an SR is considered.

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[5] Available under http://www.dg-flugzeugbau.de/flickfibel-d.html. Also available in English under the title 'Plastic Plane Patch Primer'.

[6] Available under https://members.gliding.co.uk/library/standard-repairs-to-gliders

[7] 'Indice B' contains changes agreed with EASA, subsequent amendments shall be used only if referred to in CS-STAN.

[8] To retrieve the document refer to http://maintenance_navigabilite.ffvv.org/files/2017/03/manuel-de-reparation-generique-ffvv-ind-b-pour-cs-stan-easa-4.pdf

— 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~~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.

5. Manuals

Assess whether ~~if~~ the repair could require the issue ~~issuance~~ of an AFMS.

Amend the ICAs to establish maintenance actions/inspections and intervals, as required.

6. Release to service

This SR is not suitable for the release to service of the aircraft by the ~~P~~pilot-owner.