

COMMENT RESPONSE DOCUMENT

EASA CRD for Special Condition SC E-15 Issue 2
Engine Mounts – Non-declaration of Approved Life, Applicable to Engines
[Published on 23 September 2019, and officially closed for comments on 18 October 2019]

Commenter 1 : Transport Canada Civil Aviation (TCCA) – Herschell Lubin for Robert Sincennes, 18/10/2019

Comment #1:

Representation 1

Title block/page 1.

Comment summary

If this SC is applicable to all engine types, i.e Piston, Turboprop, Turbofan, and Turboshift, does SC #E-15 take precedence over the SC for Turboshift Engines Issue 1 dated Nov. 14, 2017?

Suggested resolution

Suggest to clarify intent in Title block, if applicable.

EASA response:

EASA disagrees.

It is not common practice to include a statement of precedence in the Title block of a Special Condition, and the explanatory text already describes the reasons for the change. It should also be noted that Issue 1 of this Special Condition has been used on previous projects and is still applicable in their Certification Basis.

The text of the final Special Condition is not modified in response to the comment.

Comment #2:

Representation 2

Requirements incl. Amdt./page 1

Comment summary

See NR 1 above: If the SC is applicable to Piston engines, then include CS-E 210 in the Requirements.

Suggested resolution

Suggest to add “CS-E 210”, if applicable.

EASA response:

EASA agrees.

The text of the final Special Condition is modified as follows in response to the comment:

Heading “REQUIREMENTS”: CS-E 210 is added.

In EASA POSITION, the following sentence is added for clarity: For Piston Engines, if a single engine mount failure can lead to inadvertent engine separation and the requirements of CS-E 210 (a) cannot be met, the provisions of CS-E 515 shall apply.

Paragraph c) and d): References to CS-E 210 are added.

Comment #3:

Representation 3

General

Comment summary

To whom is this SC addressed to: TC of engines, Major Changes/Repairs, Minor Changes/Repairs, STC applications?

Suggested resolution

Identify SC applicability.



EASA response:

EASA disagrees.

It is not common practice to include such a statement of applicability in a Special Condition. Practically this SC should apply to any new engine TC for which a single mount failure may result in a Hazardous Engine Effect, and major changes/repairs to a TC where one or more engine mount(s) which such condition is affected by the change.

The text of the final Special Condition is not modified in response to the comment.

Comment #4:

Representation 4

Section c)/page 3

Comment summary

Revise “Single engine mounts identified as Critical Parts must be listed as Engine Critical Parts in the Airworthiness Limitation Section of the Instructions for Continued Airworthiness and must be identified in accordance with CS-E 510 (a)(2) and Part 21.A.805.”...to read as follows:

“Single engine mounts identified as Critical Parts must be listed as Engine Critical Parts in the Airworthiness Limitation Section of the Instructions for Continued Airworthiness *in accordance with CS-E 25(b)*, must be identified in *the Safety Analysis summary* in accordance with CS-E 510 (a)(2) and *shall be permanently and legibly marked in accordance with* Part 21.A.805.”

Suggested resolution

EASA to clarify and revise text, if needed.

EASA response:

EASA agrees.

The text of the final Special Condition [paragraph c)] is modified as proposed by the commenter in response to the comment.

Comment #5:

Representation 5

Section d)/page 3



Comment summary

Revise “The effects of a failure of any Engine mount that is classified as a Critical Part shall be established and provided to the aircraft manufacturer for consideration at aircraft level, and recorded as necessary in the instructions for installing and operating the engine.”

To read as follows:

“The effects of a failure of any Engine mount that is classified as a Critical Part shall be established *in accordance with CS-E 510* and provided to the aircraft manufacturer for consideration at aircraft level, and recorded as necessary in the instructions”

Suggested resolution

EASA to consider adding text, if needed.

EASA response:

EASA agrees.

In addition to the proposal for the commenter for referring to CS-E 510, references to CS-E 210 and CS-E 20(d) are added for completeness. The text of the final Special Condition is modified as follows in response to the comment:

Heading “REQUIREMENTS”: CS-E 20 is added.

Paragraph d): The effects of a failure of any Engine mount that is classified as a Critical Part shall be established **in accordance with CS-E 210 or CS-E 510, as applicable . Those effects shall be** provided to the aircraft manufacturer for consideration at aircraft level, and recorded as necessary in the instructions for installing and operating the engine **in accordance with CS-E 20(d)**.

Comment #6:**Representation 6**

General

Comment summary

The life of the engine mount may be influenced by other engine parts that affect the environment (vibration, corrosion, temperature, pressure, cumulative damage, etc.) and operating conditions; how is this considered in this SC?

Suggested resolution

EASA to clarify intent, if applicable.



EASA response:

EASA agrees.

The conditions that affect the life assessment as listed by the commenter are addressed in AMC E 515, and in particular in paragraph (3) Means for defining an Engineering Plan. A reference to AMC E 515, as well as other applicable AMCs, is added as an Appendix to the Special Condition.

The following text of the final Special Condition is added in response to the comment:

Acceptable Means of Compliance (AMC) to SC Engines – Engine Mounts – Non-declaration of Approved Life

AMC E 20, AMC E 25, AMC E210, AMC E 510 and AMC E 515 may be used as acceptable means to comply with the applicable provisions of this Special Condition.

Comment #7:

Representation 7

General

Comment summary

In case of changes in requirements say new start-stop cycle, new engine's usage, a different surface finish, different manufacturing process, etc.:

(A) How are these changes taken into account when done by a non-TC Holder who has no "Specified Data" nor a copy of the "Plan"?

(B) Would EASA consider putting an advisory statement in the Airworthiness Limitation Section (ALS) that repairs or alterations to engine critical parts using other data warrant additional analyses to assess the potential effect on airworthiness characteristics and the already stated limitations?

Suggested resolution

EASA to clarify intent, if applicable.

EASA response:

EASA responses to the requests for clarification:

(A) Changes involving parties other than the Design Approval Holder of the Product should be processed in accordance with the applicable requirements of Part 21.

(B) Repairs of Engine Critical Parts are addressed in AMC E 515, as well as in the applicable provisions of 21.A.433 Requirements for approval of a repair design and 21.A.435 Classification of repairs and associated AMC/GM.



The text of the final Special Condition is not modified in response to the comment.

Comment #8:

Representation 8

General

Comment summary

(A) How does this SC take into account “replacement parts” that are designed by non-TC Holder say parts that are made in the FAA system as Parts Manufacturer Approval (PMA) parts or Transport Canada system as Part Design Approval (PDA)?

(B) Would EASA consider saying that a PMA/PDA of engine critical parts is possible only when a replacement part’s design produces a MINOR change in its product?

(C) Would the engine mount be controlled in such way that any type of change would be considered a MAJOR change requiring Agency approval? If yes, by which means would EASA assure that this is the case for the life of the part?

Suggested resolution

EASA to clarify intent, if applicable.

EASA response:

EASA responses to the requests for clarification:

(A) and (B): For approval of FAA PMA and Transport Canada, and any provision related to Critical Parts, please refer to the applicable Bilateral Agreements in place (and their Technical Implementation Procedures) between the European Union and the United States of America and Canada respectively.

(C): The provisions of Part 21 for classification and approval of changes are not modified by this Special Condition.

The text of the final Special Condition is not modified in response to the comment:

Comment #9:

Representation 9

Section d)/page 3



Comment summary

Although the life limit cycles would not be stated in the AWL section of the ICA, would it be appropriate to inspect the engine mount at engine overhaul and state it in the Engine Overhaul Manual?

Suggested resolution

Suggest to clarify intent of Page 3 Section d), if applicable.

EASA response:

EASA disagrees.

Although the suggestion may be seen beneficial, it is not the purpose of this Special Condition to prescribe inspections. For those the provisions of CS-E 515 and AMC E 515 apply; in particular the Service Management Plan.

The text of the final Special Condition is not modified in response to the comment.

Commenter 2 : Rolls-Royce Deutschland Ltd & Co KG – Harald Lackner, 18/10/2019

Comment #1:

On the basis of previous positive experience it is concluded that no classification as “critical” is required for engine mounts, as the failure consequence “engine separation” is not reasonably expected to occur for a conventional design, if the parts are classified as “sensitive” and the life is significantly beyond the stated 100000 cycles. The statement “reasonably expected to occur” is quoted as stated in CS-E 510(a)(1).

EASA response:

EASA disagrees.

The engine mounts are typically subject to cyclic and dynamic loads, and EASA considers that the demonstration of “not reasonably expected to occur” cannot be fulfilled. In addition to the design and operating considerations, issues such as non-conformances, in-service damage or repairs need to be fully taken into account. In order to meet the Extremely Remote probability of failure, CS-E 510 (c) requires to apply CS-E 515.

The classification “sensitive” is applicant-specific and not described in CS-E 515.

The text of the final Special Condition is not modified in response to the comment.

