

**Comments for Draft Revisions (Not Applicable to Directives; Refer to Directive Management Officer for Directive Comment Format)**

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<b>Comments Submitted By:</b>	AIR-500
<b>Organization:</b>	
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#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
1	AC 21-25B	1	Header & Paragraph 4		The "date" section of the header is incomplete, awaiting final signature of the AC.	Once the document has been signed, fill in the date that this document was signed, both in the header and in paragraph 4.	Format	Concur.
2	AC 21-25B	1	Paragraph 5	"The purpose of this revision is to reflect amendment..."	What does "reflect" mean in this context?	Replace "reflect" with "address" or "explain the implications of" or "further clarify how the guidance...applies".	Editorial	Concur. Replaced "reflect" with "update references in accordance with".

3	AC 21-25B	2	7.1.1	<p>The Note in 7.1.1 says: "From this point forward in this AC, "X" will be included after the cited TSO to denote that various versions of the TSO may apply."</p> <p>This system makes sense and is helpful, but it is not consistent with the system used by DMO for all of the FAA's ACs. That rule, however, is used inconsistently and may be different for TSOs.</p>	<p>Consistent formatting</p> <p>Chapter 3, P 5 ("The AC Numbering System") of the updated order on ACs, Order 1320.46D, does not address this rule. It only states that the originating office has the responsibility of assigning the "revision letter" to the number and name of a revised AC. OPR should establish a clear rule on references made in an AC or order to another AC, order, or TSO.</p>	<p>As per AIR-500, when the text of an AC references other ACs and orders, the AC should cite only the subject area number and sequence number of those ACs and orders and not the revision letter that is used to indicate the current iteration of an AC or order. The goal of this rule is to keep the citations used in ACs and orders current and accurate even after the guidance documents cited in an AC or order are updated and given a new revision letter.</p> <p>Accordingly, please strike all "Xs" used as placeholders and strike all revision letters (i.e., alpha endings) to referenced ACs and orders.</p> <p>Do not remove the revision letters from the Paragraph 3 "Cancellation" section.</p>	Editorial	Concur. Made the requested changes.
4	AC 21-25B	3	7.2 3rd bullet	<p>"Under type certification procedures (in an original type certificate (TC), by supplemental type certificate (STC), or by amended type certificate (ATC)); or "</p>	<p>No acronym is established for "amended type certificate", which is only used once in this AC.</p>	<p>Insert "ATC" after "amended type certificate".</p>	Editorial	Concur. Made requested change.
5	AC 21-25B	3	7.3	<p>"...performed on a seating system should result in a product..."</p> <p>"...ACO should be contacted regarding approval to modify..."</p>	<p>Does the use of "should" create an ambiguity in this guidance? Should the word "must" be used instead?</p>	<p>If using "must" here instead of "should" clarifies the guidance, strike both uses of "should" and replace with "must".</p>	Conceptual	Concur. The first "should" was replaced with "shall" in order to more directly align with the quoted regulation, 43.13. The second "should" was replaced with "may" to satisfy another comment. The first "should"
6	AC 21-25B	3	7.3.1.2	<p>"This change required most new seats on aircraft that operate under 14 CFR part 121 and were produced after 2009 to be compliant with § 25.562."</p>		<p>Change "required" to "requires".</p>	Editorial	Concur. Made the requested change.

7	AC 21-25B	4	7.3.1.2 & Universal	"For this reason, changes to common components such as seatbelts, cushions, in-flight entertainment (IFE) systems, and seat back tray tables will require an assessment to verify that the seating system structural integrity and occupant injury performance is maintained."	Consider using the active voice for stronger writing and to better identify who must take certain actions.	"For this reason, if you make changes to common components such as seatbelts, cushions, in-flight entertainment (IFE) systems, and seat back tray tables, you must conduct an assessment to verify that the seating system structural integrity and occupant injury performance is maintained."	Editorial	Concur
8	AC 21-25B	5	8.1.3	"The determination of a major or minor design change, repair, or alteration varies, and depends on which FAA approval is being affected."	The comma after varies is not needed, as it separates the two verbs "varies" and "depends on".	Remove the comma after "varies".	Editorial	Concur. Made the requested change.
9	AC 21-25B	5	8.1.4.1	"For example, a seatbelt that has been modified by the TSO-C22X manufacturer with a minor design change, and continues to meet the requirements of TSO-C22X, may or may not continue to be acceptable for..."	In the quoted text, commas are used to set off a phrase that is essential to the meaning of the sentence, so the commas should not be used.	"For example, a seatbelt that has been modified by the TSO-C22X manufacturer with a minor design change, and <u>that</u> continues to meet the requirements of TSO-C22X; may or may not continue to be acceptable for..."	Editorial	Concur. Made the requested change.
10	AC 21-25B	6	8.2.1.1 8.2.1.2	The subtitles here ("Static Strength" and "Dynamic Strength and Occupant Injury Protection") don't stand out much for the reader to notice.		Consider underlining these subtitles (here and throughout this AC).	Editorial	Concur. Made the requested change.
11	AC 21-25B	6	8.2.1.1.2	"If a cushion is removed for the test, or if a seat cushion compression varies from 2 inches, the location for applying the loads must be changed accordingly."		If a cushion is removed for the test, or if a seat cushion compression varies <del>from</del> <u>by</u> 2 inches, the location for applying the loads must be changed accordingly.	Conceptual	Not Adopted. This is directly from the standard and we do not wish to add any confusion by changing the language.
12	AC 21-25B	6	8.2.1.2	"Some common examples of modifications that will require substantiation and likely will require re-testing to verify continued compliance with the dynamic requirements of §§ 2X.562 and/or TSO-C127X are discussed below."	Would it help the reader to state here where these examples may be found?	"Some common examples of modifications that will require substantiation and likely will require re-testing to verify continued compliance with the dynamic requirements of §§ 2X.562 and/or TSO-C127X are discussed in paragraph [X] below."	Editorial	Concur. Made the requested changes, by inserting 8.2.1.2.1, 8.2.1.2.2, and 8.2.1.2.3 for the paragraph #s.

13	AC 21-25B	7	8.2.1.2.2	"Restraints that are approved according to TSO-C22X or TSO-C114X 8.2.1.2.2 are only evaluated relative to static structural requirements, and are not independently certified to meet dynamic seating system requirements."	Incorrect comma usage.	"Restraints that are approved according to TSO-C22X or TSO-C114X 8.2.1.2.2 are only evaluated relative to static structural requirements; and are not independently certified to meet dynamic seating system requirements."	Editorial	Concur. Made the requested change.
14	AC 21-25B	8	8.2.3	"For example, some changes to the seating system have no effect on the continued compliance to the applicable TSO standard, but may affect compliance to airworthiness requirements for a particular installation. For example, a change in the recline angle of the seat may affect compliance to emergency exit row requirements."	"for example" is used twice. Is that intended?	It seems that the first sentence in the "Note" should be a statement ("Some changes to the seating system...") and that the second sentence should be the example. If so, please change to:  "Note: Some changes to the seating system have no effect on the continued compliance to the applicable TSO standard, but may affect compliance to airworthiness requirements for a particular installation. For example, a change in...."	Editorial	Concur. Made the requested change.
15	AC 21-25B	8	9	After successfully showing compliance with the applicable regulations, the modifier should receive approval from the FAA pursuant to § 21.8 or § 43.13.	As written, this could mean that the modifier is likely to receive approval, or that the modifier should take action to receive approval.	Replace "should receive" with "seek", "be able to obtain", or "must obtain".	Editorial	Concur. Changed the sentence to read:  "After successfully showing compliance with the applicable regulations, the modifier should seek approval from the FAA pursuant to § 21.8 or § 43.13."

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#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
1	AC 21-25B	3	7.3.1.2	Although §§ 2X.562 are applicable to new type-certificated aircraft, an operational rule change pursuant to 14 CFR 121.311(j) in 2005 significantly accelerated a conversion to dynamic seats. This change required most new seats on aircraft that operate under 14 CFR part 121 to be compliant with § 25.562. Pursuant to § 121.311(j), aircraft that were not required to meet § 25.562 as part of the original type design are now required to meet the new § 25.562 requirement for any new aircraft produced.	Sentences imply that all modified seats in Part 121 operation must meet 25.562, but the rule is only applicable to transport airplanes operated under Part 121.	Although §§ 2X.562 are applicable to new type-certificated aircraft, an operational rule change pursuant to 14 CFR 121.311(j) in 2005 significantly accelerated a conversion to dynamic seats. This change required most new seats on <b>transport</b> aircraft that operate under 14 CFR part 121 to be compliant with § 25.562. Pursuant to § 121.311(j), <b>transport</b> aircraft that were not required to meet § 25.562 as part of the original type design are now required to meet the new § 25.562 requirement for any new aircraft produced.	Conceptual	Concur. Made the requested change.
2	AC 21-25B	4	7.3.1.2	The new §§ 2X.562 requirements took distinct parts of the seats that were typically evaluated separately, such as seat belts and flotation cushions, and created an integrated seating system evaluation method by levying requirements on the seating system as a whole. Any changes to the individual parts that affect their strength or stiffness may in turn affect the seating system and impact the dynamic loading of the structure, as well as the loads transferred to the occupant. Therefore, a modification to a part either in the direct load path or within striking distance of the occupant will typically require a dynamic assessment. For this reason, changes to common	Potential exists for an ACO to apply this SAC to any change to inflight entertainment systems.	The new §§ 2X.562 requirements took distinct parts of the seats that were typically evaluated separately, such as seat belts and flotation cushions, and created an integrated seating system evaluation method by levying requirements on the seating system as a whole. Any changes to the individual parts that affect their strength or stiffness may in turn affect the seating system and impact the dynamic loading of the structure, as well as the loads transferred to the occupant. Therefore, a modification to a part either in the direct load path or within striking distance of the occupant will typically require a dynamic assessment. For this	Editorial	Concur. Made the requested change.
				components such as seatbelts, cushions, in-flight entertainment (IFE) systems, and seat back tray tables will require an assessment to verify that the seating system structural integrity and occupant injury performance is maintained.		reason, changes to common components such as seatbelts, cushions, in-flight entertainment (IFE) system hardware, and seat back tray tables will require an assessment to verify that the seating system structural integrity and occupant injury performance is maintained.		

3	AC 21-25B	5	8.1.3 Note	"...in a policy memorandum titled "Classification of Design Changes to TSO-C39b, TSO-C127, and TSO-C127a Articles," dated September 8, 2003."	Clarification for users to find the document.	"...in policy memorandum <b>PS-AIR100-9/8/2003</b> titled "Classification of Design Changes to TSO-C39b, TSO-C127, and TSO-C127a Articles," dated September 8, 2003."	Editorial	Concur. Made the requested change.
4	AC 21-25B	6	8.2.1.2	Entire paragraph	Omits AC 20-146, Methodology for Dynamic Seat Certification by Analysis for Use in Part 23, 25, 27, and 29 Airplanes and Rotorcraft, which a means of compliance for 2x.562.	Add the following to end of the paragraph: "AC 20-146, Methodology for Dynamic Seat Certification by Analysis for Use in Part 23, 25, 27, and 29 Airplanes and Rotorcraft, is another means of compliance to 2x.562."	Conceptual	Concur. Made the following change: "As an alternate to testing for compliance to 2x.562, analysis may be used in accordance with the guidance defined in AC 20-146, Methodology for Dynamic Seat Certification by Analysis for Use in Part 23, 25, 27, and 29 Airplanes and Rotorcraft."
5	AC 21-25B	7	8.2.2	Entire paragraph	This paragraph implies that Appendix F of Part 25 is required for all airplanes. Part 23 normal, utility and acrobatic airplanes must meet the flame-resistant requirement of 23.853(a) using AC 23-2A and commuter airplanes must meet the self-extinguishing requirement of 23.853(d) using Part 23, Appendix F, Part 1. TSO-C39 and C127 only required transport airplanes to meet Part 25, Appendix F.	Need to cite Part 23, Appendix F, Part 1 and AC 23-2A as applicable to Part 23 airplanes.	Conceptual	Concur; paragraph now reads:  8.2.2 Fire and Flammability Tests. The modified seating system must be shown to meet the applicable flammability requirements. The TSO flammability requirements vary dependent upon both the TSO revision and on the classification of the seating system; such as: transport airplane, normal rotorcraft, commuter, etc. Furthermore, the flammability requirements vary dependent upon the aircraft airworthiness requirements and the amendment level. 8.2.2.1 An example of a common modification for transport aircraft TSO-C127 aircraft seats are modifications to the cushion. Transport aircraft seats typically require an oil burner test on a set of representative production seat cushion test specimens. A change to the seat cushion system design might affect the flammability characteristics of the system. Thus, a new configuration or combination of foam, fire blocking layer, and dress cover will require additional testing and approval to establish compliance with the flammability standards. However, changes to dress covers may be qualified by similarity. AC 25.853-1, Flammability Requirements for Aircraft Seat Cushions, provides additional information on the approval of seat cushion dress covers on the basis of similarity. If there is a question as to whether a design change to a cushion system is significant enough to require retesting, the

6							<p>local FAA ACO should be consulted. 8.2.2.2 The requirements for small aircraft seats vary dependent on the TSO seat classification and aircraft category. For example, per TSO-C127b Type C - Normal, Utility and Acrobatic category aircraft seats must have flame resistant properties. FAA AC 23-2A, Flammability Tests, provides a test procedure for flame resistant testing. TSO-C127b also requires Type C - Commuter category seats to be self-extinguishing and tested pursuant to 14 CFR part 23, Appendix F, Part I.</p> <p>8.2.2.3 There may be circumstances where the testing required by the TSO for flammability is insufficient for installation compliance. For example, some transport airplane require that seats with large non-metallic panels to meet heat release and smoke emission requirements pursuant to 14 CFR, part 25, Appendix F – part IV and part V. Compliance to the heat release and smoke emission is not required under the TSO; therefore in this scenario the installer of the modified seat must ensure that the heat release and smoke emission requirements continue to be met.</p>
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#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
1	AC 21-25B	1	Purpose	Purpose Paragraph	Address "Repair" applicability early on.	Clarify that this policy is in reference to Design Changes, as in modifications or alterations, and is not intended to address a serial number specific repair. While, repair guidance may be similar this policy is written to address concerns regarding design changes and alterations.		We do not concur that repairs are not addressed by this guidance. Repairs are inferred with the reference to part 43 in section 1.1. However we will further clarify purpose statement. Section 1.1 of the purpose statement now reads:  "This advisory circular (AC) provides information, clarification, and procedural guidance concerning the approval and installation of modified technical standard order (TSO) approved seating systems in U.S. type-certificated aircraft. Modifications that result from design changes, repairs, and alterations are addressed in this AC, pursuant to Title 14 of the Code of Federal Regulations (14 CFR) part 21 and part 43."
2	AC 21-25B	1	Purpose	Paragraph 8.1.2 states, "...therefore, repairs and alterations based solely on compliance to TSO article requirements are not appropriate."	This sentence is SO important I would also include it in the "Purpose" section.	Update Purpose to include this statement.	Format	Partially concur; the insertion for comment #1 should help resolve this matter. See above.
3	AC 21-25B	3	7.2	"Pursuant to 21.8, the design approval to modify the seating system must be obtained..."	This seems to focus on approval of the article (which in this case is a "Seating System", which may include several TSO'd components. While 21.8(c) refers to under type certificate procedures, this seems to exclude 21.93/95/97 which actually address making design changes (not necessarily the approval of the article).	Address 21.93/95/97 in this section.	Conceptual	No change necessary. 21.8c talks about type certification procedures, which is for all procedures in part 21 including 21.93/95/97.
4	AC 21-25B	3	7.3	"... ACO should be contacted..."	What is the basis for saying the FSDO and, as required, the ACO regarding approval? There is no requirement for the installer to contact the FSDO or ACO unless they require an approval from them.	Clarify wording for why the FSDO or ACO should be contacted. (Perhaps "may" was meant?)	Conceptual	Concur. Replaced "should" with "may".

5	AC 21-25B	3	7.3	References under 7.3	Why is AC 21-47 not included in the references section? (not sure if this is an oversight or intentional.) This AC would be applicable if an applicant needs design change data approved by the ACO, etc.	Include AC 21-47 in References section under 7.3	Conceptual	Concur. Added the following reference to AC 21-47:  AC 21-47, Submittal of Data to an ACO, a DER or an ODA for a Major Repair or a Major Alteration, provides guidance to create a complete data package for a major repair or alteration.
6	AC 21-25B	4	8.1.1	"Each applicant seeking approval to install a modified TSO article in an aircraft must show that the modification meets the applicable airworthiness requirements for the aircraft type design as specified in 21.101, or pursuant to 43.13."	The reference to 21.101 seems to imply that (1) they need to step up to the latest regulations under 21.101(a), and/or potentially (2) this is somehow different than an unmodified seating system. Unmodified seating systems must also meet this same requirement. A TSO is not installation approval.	Clarify the context or perhaps break Design Control for the Installation into "TC/STC Design Approval Holders" and "Other Approval Methods (such as Field Approval or Return to Service with DER-Approved Data)". Perhaps replace the subject text with: "Unmodified Seating Systems (those installed without modifications to the approved TSOA configuration), require the installation to meet the applicable airworthiness certification basis in accordance with 14 CFR 21.101, or the original certification basis (including any applicable Airworthiness Directives) if approved as "alteration data" pursuant to 14 CFR Part 43. This same requirement is still applicable if the seating system is modified. The installer must show that the installation of the modified seating system meets all of the same applicable certification requirements as the unmodified seating system.	Conceptual	This comment is out of scope, as the AC specifically addresses modified seating systems.
						This may require the development of new data to show compliance to installation requirements depending on the complexity of the modifications."		
7	AC 21-25B	4	8.1.1	"If the applicant is the article manufacturer and is electing to show that the modified article still meets the TSO standards, the requirements of 21.619 apply."	This statement doesn't in totality use the same language as the regulation, or cover the possibility that the change is made by someone other than the manufacturer.	"If the applicant is the article manufacturer which holds the TSOA, and is electing to show that the modified article still meets the TSO standards, then 14 CFR 21.619(a) or (b) applies. However if the modification (design change) is being made by someone other than the manufacturer holding the TSOA, then the provisions of 21.619(c) apply."		Concur. Added the suggested text.

8	AC 21-25B	4	8.1.2	"...therefore, repairs and alterations based solely on compliance to TSO article requirements are not appropriate."	Include the possibility that the same TSO component may be installed on multiple models with varying certification basis/	Add a statement to the effect: "The installer should be aware that TSO articles may be used on multiple aircraft models with varying certification basis and airworthiness directives; therefore the data required for installation may differ from model to model. <del>An installer should not rely on a previous approval for a different model aircraft unless the certification basis, airworthiness directive status, and installation configuration is verified as being identical (or at least similar enough that any differences would not affect compliance with the applicable requirements)."</del>	Conceptual	Concur with intent. Modified 8.1.2 to state:  ...However, an article initially approved under a TSO is approved only for design and production of the article, and a separate approval is required for installation of that article in an aircraft. <u>Therefore, the use of a TSO approved seat, berth, floatation cushion or restraint does not guarantee a compliant aircraft installation.</u> The installer should be aware that TSO articles may be used on multiple aircraft models with varying certification basis, special conditions, and airworthiness directives; therefore the data required for installation may differ from aircraft model to model. AC 21-50, Installation of TSOA Articles and LODA Appliances, provides additional guidance on the acceptable use of TSO data for installation approval...
9	AC 21-25B	5	8.1.3	"Regardless of how a modification is classified, all modifications must be substantiated relative to the applicable requirements."	Reinforce the very important point of compliance.	Add a statement to the effect: "the differences between major and minor (regardless of design change versus alteration data) can be summed up as one requires approved data, while the other does not necessarily require approval; nonetheless the same level of compliance showing is expected."	Editorial	Change not adopted; original wording is clear and more succinct.
10	AC 21-25B	5	8.1.3	"Major vs Minor Design Change, Repair, or Alteration"	I would be careful about including "Repairs" as a design change, as they are considered to be a restoration. The inclusion of "Repair" may cause more confusion than it is worth since now you can involve Repair Station (or component repairs) into the equation.	Remove "Repair" language.	Conceptual	Change not adopted. It is the intent of this AC, as described in the purpose, to address repairs. There are major/minor repairs, and it may cause confusion how that relates to determining a major/minor TSO design change. So we feel that it is important to distinguish that these are not the same.

11	AC 21-25B	5	8.1.4.1	"Similarly, it is the TC/STC holder's responsibility to ensure design changes made to TSO articles continue to meet the applicable airworthiness requirements of the aircraft."	What if the installation was not approved by a TC or STC? Some have been done by Field Approval or via DER-approved data (reference the Major Alteration Job Aid). This is problematic because 21.619(c) refers to "approval for <i>design changes</i> under part 43", implying no difference between an alteration (as a design change) or a type certificate data design change. TC/STC Holders are only responsible to ensure that design changes that they choose to incorporate remain compliant. Any changes made to the TSO article but not referenced (or known) cannot be addressed by the DAH.	It is ultimately the owner/operators responsibility to ensure that the aircraft is compliant. The TC/STC DAH is responsible to ensure that their design (and any revisions i.e. design changes that they incorporate) remain compliant. Changes made by the TSOA, and not addressed by the TC/STC Holder, must be addressed by the Installer since the approved design (TC/STC) does not address such changes. In the case where the original installation of an unmodified TSO article was based on a Field Approval or Return-to-Service via FAA Form 337 using DER-approved Data, it is the Installer's responsibility to ensure that the any modifications to the TSO article remains compliant at the aircraft installation level and has all adequate approved data. This may require removal of the TSO tag from the article.	Conceptual	Change not adopted. It may not be fully accurate to state that the installer is responsible for design control - especially if they are going to an FAA repair station for repairs. What is being proposed to add is the general requirement/expectation that exists for alterations and repairs to meet the applicable airworthiness requirements of the aircraft, and we have addressed that in other portions of the document such as 8.1.1.
12	AC 21-25B	5	8.1.4.1 Note	"This scenario creates a situation in which there are multiple levels of FAA approvals, and clear responsibility for design changes must be understood."	Sentence seems awkward.	Suggest: "This scenario creates a situation in which there are multiple levels of FAA approvals, where the 'approver' of the design change is different based on each element of the seating system."	Editorial	Change not adopted; we believe the original wording to be more clear.
13	AC 21-25B	5	8.1.4.1 Note	"Similarly, it is the TC/STC holder's responsibility to ensure design changes made to TSO articles continue to meet the applicable airworthiness requirements of the aircraft."	As described above, this does not address other means of installation approval per the referenced section of Part 43.	Suggest: "Similarly, it is the TC/STC holder's (or the Installer's as noted above) responsibility to ensure design changes made to TSO articles continue to meet the applicable airworthiness requirements of the aircraft."	Conceptual	Not adopted. Similar to the resolution to Comment #11, we do not have the mechanism in place to require the installer, e.g. Delta airlines, to control the design.
14	AC 21-25B	8	9	"...pursuant to 21.8..."	May want to address items that are done solely as per 21.93/95/97 (whereas 21.8 might be the lead-in) but a specific article approval is not issued.	Consider including reference to 21.93/95/97.	Editorial	Not adopted. Current language is sufficient as 21.8c includes type certification procedures including those approved in accordance with 21.93/95/97. Adding the proposed language would be unnecessarily limiting as 21.93 addresses changes to type design. It does not address the scenario where an TC holder modifies a TSO seat as part of a new design. Leaving the language as is would address both changes to just the TSO article and changes to existing type designs.

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#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
1	AC 21-25B	2	7.1.2	"Seating systems commonly integrate other TSO-approved articles into the design of the article."	Address that there are also "Non TSO approved articles" installed in the seats.	Add a new paragraph subsection or add that there are also non TSO articles so people understand it is the entire seating system, including all non-TSO articles like IFE, floor prox lighting, placards, etc	Conceptual	Concur. Added new sub-paragraph 7.1.3:  "7.1.3 In addition, there are typically non-TSO functions (NTF) integrated into the seating system. These functions are provided by components such as in flight entertainment systems, floor proximity lighting and reading lights. The NTF is defined as part of the descriptive data for the TSO article. Acceptance of the NTFs is done on a "non-interference" basis relative to the compliance of the TSO requirements for the seat. The NTF descriptive and substantiation data are evaluated by the FAA for compliance to the MPS of the TSO (such as structural, occupant injury, and flammability requirements). NTF descriptive or substantiation data that is not needed to show compliance to the TSO MPS is evaluated separately during the aircraft installation approval. Additional guidance for NTF in seats is provided in FAA Policy Statement, PS-AIR-21-130-03-01, Clarification for Non-TSO Functions in Seats."
2	AC 21-25B	3	7.3	Mention ICA here and Order 8110.54?	This appears to be discussing after market, so we should mention ICA's here to remind people they need to make sure that they update the information if required		Conceptual	Not required. All 3 of the docs referenced in this section talk about the need to update ICA's and some reference Order 8110.54.  ICA updates are not just for modifications under part 43, but also for part 21. Therefore this is generically discussed in section 8.2.4 Maintenance Instructions of this AC.
3	AC 21-25B	4	7.3.1.2	For this reason, changes to common components such as seatbelts, cushions, in-flight entertainment (IFE) systems, and seat back tray tables <u>(ADD or any other item added to the seat)</u> will require an assessment to verify that the seating system structural integrity and occupant injury performance is maintained.	add a generic statement to make sure we cover all bases in the future of what could be added to the seat and not limit ourselves		Conceptual	Concur. The sentence now reads:  "For this reason, changes to common components such as seatbelts, cushions, in-flight entertainment (IFE) systems, seat back tray tables, and any other item added or removed from the seat will require an assessment to verify that the seating system structural integrity and occupant injury performance is maintained."
4	AC 21-25B	4	8.1.1	All modifications must be substantiated by test and/or analysis to show that the applicable requirements are met.	Might want to mention here that 2x.562 is usually done via test since some applicants will try and do analysis without data to substantiate		Editorial	Agree with intent; however no change needed as it is already addressed in 8.2.1.2 that specifically addresses dynamic performance. The AC states: "Some common examples of modifications that will require substantiation and usually require re-testing to verify continued compliance with the dynamic requirements of §§ 2X.562 and/or TSO-C127X are discussed below."

5	AC 21-25B	4	8.1.1	the requirements of § 21.619 apply.	general comment: you might want to list the amendment levels of the CFR's you are noting for clarity since this regulation has changed so much. Or list something at the beginning preamble for the regulation basis		Conceptual	Concur. Subpart O of part 21 are procedural requirements that must be followed to the latest amendment by TSOA/LODA holders. Section 5, Changes, states the amendment level for part 21. All other references to airworthiness requirements are best left without an specific amendment as the guidance intends for the installer to determine the applicable aircraft installation requirements which include compliance to a specific amendment level.
6	AC 21-25B	4	8.1.2	You might want to note here that there may be additional requirements to install TSO , example heat release/smoke density on large non metallic parts	some applicants think TSO = all aircraft level requirements and it is not, clarify for industry		Conceptual	Concur. The following sentence within 8.1.2 clarifies this:  "...However, an article initially approved under a TSO is approved only for design and production of the article, and a separate approval is required for installation of that article in an aircraft. Therefore, the use of a TSO approved seat, berth, floatation cushion or restraint does not guarantee a compliant aircraft installation. AC 21-50, Installation of TSOA Articles and LODA Appliances, provides additional guidance on the acceptable use of TSO data for installation approval..."
7	AC 21-25B	5	8.1.4.1	We heavily focus on the approved TSO articles within the seat, but you might want to mention the non TSO articles like IFE and floor proximity lighting, placarding, etc.	clarify for industry it is all items in the seat not just other TSO articles within the seat		Conceptual	Concur - Added paragraph 8.1.4.1.2: "Seats are often integrated with electronic components. Some types of changes do not affect compliance to the TSO MPS, but may affect compliance to the installation airworthiness requirements. Furthermore, other types of changes to the electronic components may affect compliance to the TSO MPS. AC 21-49, Gaining Approval of Seats with Integrated Electronic Components, provides guidance for the design control of electronic components in seats."
8	Approval of Modified Seating Systems Initially Approved Under a Technical Standard Order	6	8.2.1.2.1		Paragraph does not align with AC 25.562-1B (which does not align with the latest revision of TSO-C127). The addition of a constituent of the foam or removal of an ingredient is also cause for requalification. The manufacturing process can also affect the performance of the seat cushions. A manufacturing process change can adversely affect the lumbar response.			Concur. Changed 1st sentence of 8.2.1.2.1 to state: Seat cushions that use modified materials (e.g. material changes, manufacturing process changes, additions to or modifications of padded dress covers, or modified buildups of identical materials) require substantiation because of the possible increase on pelvic and lumbar column compressive loading or belt loading under the downward and forward combined loading test.
9	AC 21-25B	7	8.2.1.2.3	Paragraph discusses modified seat backs.	Suggest to add "meal tray assembly" modifications within paragraph, since tray assemblies are also related to seat back assemblies and it is possible that seat manufacturers will update components to these common parts. Also, tray tables are mentioned in paragraph 7.3.1.2. as an exmple of common component that require assessment.	Expand on paragraph to add that evaluations/substantiation of changes in any parts of the meal tray assemblies also should be considered.	Editorial	Concur. Paragraph 8.2.1.2.3 now reads:  8.2.1.2.3 Modifications to passenger entertainment system components, and to the meal tray assembly, must be substantiated to determine their effect on the dynamic performance of the seating system and whether the modified system still meets the HIC. For example, changes to these parts that alter the stiffness may affect the ability to absorb impact loads during HIC testing and changes to the meal tray latch may affect the ability of the meal tray to remain stowed.

10	Approval of Modified Seating Systems Initially Approved Under a Technical Standard Order	6	8.2.2.2.1		Paragraph does not align with AC 25.562-1B (which does not align with the latest revision of TSO-C127). The addition of a constituent of the foam or removal of an ingredient is also cause for requalification. A manufacturing process change can adversely affect the material response to both the Vertical burn test and the oil burner test.			concur but no change required since we addressed the types of seat cushion modifications in section 8.2.1.2
11	AC 21-25B	7	8.2.1.2.1	Paragraph discusses modified seat cushions.	Add to paragraph the assumption that net SRP change is acceptable as result of the cushion change, which is reason that 16g testing is not impacted.  Recommend to add new paragraph to show example cushion change which could possibly affect 16g testing.	For additional scenarios where cushion change does affect SRP, suggest to state that substantiation needs to be conducted to investigate impact on previously approved data for 16g structure, as well as photometric analysis (if applicable).	Conceptual	Partially adopted. While there is guidance in AC 25.562-1b on this subject, there is not guidance for the other aircraft types. While a modifier to a seat on a part 25 aircraft may use the guidance in AC 25.562-1b, we have not yet coordinated this position across other aircraft types. We did add the following sentence to this section: "Changes to the seat reference point (SRP) should also be evaluated for acceptability."
12	AC 21-25B	7	8.2.2	Pursuant to paragraph (d)(2)(iv) of 14 CFR part 25, appendix F, part II, transport category airplanes require an oil burner test on a set of representative production seat cushion test specimens	This is an uncommon way of noting the CFR, recommend you note it similar to how it is noted by DER's: 14 CFR Part 25, Appendix F Part II, (d)(2)(iv) - or list the regulatory reference 14 CFR Part 25 25.853	clarify per industry standards	Editorial	Concur, however this reference has been removed based on other comments received.
13	AC 21-25B	8	8.2.3	Installation Limitations	The text preceding the note does not clearly articulate the fact that any changes to the original installation limitations may have an impact on compliance to the airworthiness standards associated with the seating installation.	Suggest a revision to the paragraphs 8.2.3 text to add the phrase, "when considering the impact the modification has with compliance to the airworthiness standards for a given installation" for clarity and to coincide with the example provided in the paragraph 8.2.3 note.	Editorial	Partially Concur. The TSO installation instructions are written such that when installed in that manner, the TSO article continues to meet the TSO MPS. They do not and cannot convey approval to the airworthiness regulations. Section 8.2.3 now reads.  8.2.3 Installation Instructions and Limitations (IIL). Modifications to TSO seating systems may affect the original TSO IIL; therefore, modifications should address the potential impact that the modification has to the TSO IIL. It is important to distinguish that the TSO IIL are intended to give instructions to the installer for how to install the TSO article such that it continues to meet the requirements of the TSO. The TSO IIL does not ensure compliance to all of the applicable aircraft installation airworthiness requirements.

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#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
1	AC 21-25B	7	8.2.1.2.1	"...require substantiation because of the possible increase on pelvic and lumbar column compressive loading under the downward and forward combined loading test."	The issue with the forward combined loading test is a change in SRP or also a possible increase in belt or anchor loads	Add: "...require substantiation because of the possible increase on pelvic and lumbar column compressive loading OR BELT LOADING under the downward and forward combined loading test." Also add "Changes to the SRP should also be evaluated for acceptability."	Conceptual	Concur. Made the suggested changes.
2	AC 21-25B	7	8.2.1.2.1	"Seat cushions that use modified materials..."	Does a modified buildup include a change to a dress cover such as adding padding or changing the thickness of padding in a dress cover.	Consider adding additional information to this paragraph. "Seat cushions that use modified materials, ADDITIONS TO OR MODIFICATIONS OF PADDED DRESS COVERS, ..."	Conceptual	Concur. Made the suggested changes.
3	AC 21-25B	3	7.3.1.1	"Historically, seat certification and subsequent modifications have only involved static structural requirements."	While this AC is an update, I think we have moved beyond historical static only testing since we have had a dynamic rule for almost 30 years now.	Consider deleting this sentence and references to "new" regulations.	Editorial	Concur. Removed the word "new" but left the rest of the sentence in place, given that it serves as a lead-in to the next paragraph and lets the reader know where to find the dynamic seat regulations.
4	AC 21-25B	4	7.3.1.2	".. §§ 2X.562 requirements took distinct parts of the seats that were typically evaluated separately, such as seat belts and flotation cushions.."	Remove flotation cushions as the rule is more general and includes all cushions.	".. §§ 2X.562 requirements took distinct parts of the seats that were typically evaluated separately, such as seat belts and cushions.."	Conceptual	Not Adopted. While the comment is correct that the rule more generally affects all cushion types, the intent of mentioning flotation cushions is to infer that they were approved under a separate TSO. In order to clarify the confusion we changed the sentence to state: "...The new §§ 2X.562 requirements took distinct parts of the seats that were typically approved separately, such as TSO seat belts and flotation cushions, and created an integrated seating system evaluation method by levying requirements on the seating system as a whole..."