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SPORT PILOT - LIGHT SPORT AIRCRAFT



(Aerotrek): Failure to maintain a SLSA in accordance with its maintenance manual and ASTM standards will result in the aircraft going out of compliance with its Special Airworthiness Certificate, and therefore becoming unairworthy. Market value will also suffer.



(Allegro): SLSA with Rotax engines might require maintenance to be done by technicians with Rotax-authorized training. Check the maintenance manuals for specifics.



(Gobosh): Special Light Sport Aircraft might look a lot like FAA type-certificated production airplanes, but they are subject to a new and very different set of regulations and standards for major repairs and alterations.



(Cheetah): Since many SLSA are imported and distributed by U.S. companies, it is important to know who the "manufacturer" is for purposes of authorizing major repairs and alterations.

ASTM Compliance For Special Light Sport Aircraft: Major Repairs & Alterations

A few minutes spent now learning and understanding this new world, could save owners and maintenance personnel huge headaches in the future.

by Carol Carpenter

When I was asked by *Midwest Flyer Magazine* Associate Editor, Ed Leineweber, to write this article, the requested topic was "Compliance Issues and Special Light Sport Aircraft (SLSA)." However, all of the current compliance issues are each a topic in themselves. If I summarized all the compliance issues by topic, there would not be enough space to offer useful information to the reader. Instead, I will focus on one area: "major repairs and alterations."

There have been multiple questions from mechanics and SLSA owners about proper documentation and authorization for major repairs and alterations in the field. If you are confused, you are not alone. The Light Sport Rule is relatively new and was a large, sweeping change in the regulations. There is a lot to learn and understand. Additionally, SLSA aircraft must comply with ASTM

International Consensus Standards, as well as Federal Aviation Regulations. (Note: ASTM used to stand for American Society for Testing & Materials, but today the organization is just referred to as ASTM International.)

What Are Consensus Standards?

Consensus Standards are industry-developed standards that apply to aircraft design, production, and airworthiness. They are accepted by the FAA for the purpose of certificating light sport aircraft. The continued airworthiness of SLSA is governed by these standards, which are copyright protected and can only be purchased from ASTM International (<http://www.astm.org/>). All regulatory bodies and manufacturers must purchase their own copy of the standards, read, and interpret them. The aircraft must be maintained to these industry-developed standards, meet FAR Part 43 requirements, and comply with manufacturers' safety directives and FAA Airworthiness Directives applicable to Type Certificated (TC) products installed on the aircraft.

SLSA Maintenance Manuals

ASTM standards require that all SLSA have maintenance manuals. The maintenance manual must lay out what level of maintenance technician certification is required to do a particular task, and provide detailed instruction to complete the task. If a task is not in the manual, you cannot complete it without special manufacturer authorization. There is a huge difference in the quality and completeness of manuals provided by the SLSA manufacturers. But the manufacturer's maintenance manuals must be your source of what you can and cannot do. If it is not in the manual, you cannot do it without a Letter of Authorization, as explained next.

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Documentation Required For SLSA Major Repair or Alteration?

For an SLSA, the aircraft manufacturer must approve any modification – including installation of new avionics. The manufacturer also determines what is a major repair or major alteration. In order to discuss a major repair and alteration on SLSA, we should start by looking at the ASTM standards and a few regulations in place for this specific category.

The definition of a major repair or alteration for SLSA was required to be included in the ASTM standards by the FAA and is documented in the preamble of the final rule. ASTM defined the terms in ASTM F2483 as follows:

3.1.10 major repair, alteration, or maintenance – any repair, alteration, or maintenance for which instructions to complete the task excluded from the maintenance manual(s) supplied to

the consumer are considered major.

3.1.11 manufacturer – any entity engaged in the production of an LSA or component used on an LSA.

3.1.12 minor repair, alteration, or maintenance – any repair, alteration, or maintenance for which instructions provided for in the maintenance manual(s) supplied to the consumer of the product are considered minor.

9.2 The manufacturer or other entity that performs the evaluation of an alteration or repair shall provide a written affidavit that the aircraft being altered will still meet the requirements of the applicable ASTM design and performance specification subsequent to the alteration.

9.3 The manufacturer or other entity that performs the evaluation shall provide written instructions and diagrams on how, who, and the level of certification needed to perform the alteration or repair.

9.3.1 The instructions must include

ground and flight testing that complies with the original ASTM production acceptance testing standard, as appropriate, to verify the alteration was performed correctly and the aircraft is in a condition for safe operation.

9.4 The manufacturer or other entity that performs the evaluation shall provide information to the owner of the aircraft for the documentation of the alteration in the aircraft's records.

AC 65-32

306. a. Maintenance and Alterations. Any maintenance or alteration that is performed on an SLSA must be accomplished using data supplied by the manufacturer and performed by a repairman (light-sport aircraft) with a maintenance rating, a mechanic with an airframe and powerplant rating, or a repair station appropriately certificated for that class of SLSA in accordance with part 43.



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So, what documentation is required to be in the aircraft records for any major change or alteration? The manufacturer is required to provide:

1. Directions to accomplish the task;
2. Detailed instructions and diagrams as needed to perform the task;
3. A method to test/inspect to verify the task was accomplished properly; and
4. An affidavit stating that the modification, repair or alteration will not change the aircraft flight characteristics.

It is not uncommon for manufacturers in the SLSA industry to send incomplete letters of authorization; many offer authorization by phone. When this happens, the maintenance technician must ask for these authorizations in writing and resubmit any authorization that is incomplete.



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Who Is The Manufacturer?

Many SLSA are manufactured in other countries and have U.S. distributors. So the common question is: *Can a distributor authorize a change?* The regulations are clear (Reference 91.327 (a) (5), (6) and (7)) that the manufacturer, inspected by procedures developed by the manufacturer, and recorded in the specific aircraft records, must authorize any modification after the date of manufacture. The FAA considers the manufacturer as the entity that attests to compliance with the ASTM standards on the FAA form 8130-15. Further, the ASTM Quality Assurance Standard F 2279 requires that the person signing compliance with the ASTM standards, be specifically identified in the manufacturer's Quality Assurance Manual, and that the approval be accomplished in accordance with a documented system/procedure that assures that the aircraft continues to comply with all the applicable ASTM standards.

Who Can Perform A Major Repair Or Alteration?

ASTM F2483 9.3 states that the manufacturer must identify in writing the instructions for the modification, who is authorized to perform the modification, and the level of technician certification that person must have. The person performing the repairs must also have had training or experience in performing that task previously.

9.3 The manufacturer or other entity that performs the evaluation shall provide written instructions and diagrams on how, who, and the level of certification needed to perform the alteration or repair.

FAA Advisory Circular 65-32:
Major repairs and major alterations may only be accomplished on SLSA by a repairman (light-sport aircraft) with

a maintenance rating, a certificated mechanic with A&P ratings, or a certificated repair station. The manufacturer must provide the technical data for such a repair or alteration and identify the training required, if any, to perform that repair or alteration.

. . . Before making any major repair as per the consensus standard, a repairman (light-sport aircraft) with a maintenance rating, a mechanic with an airframe and powerplant rating, or appropriately certificated repair station, must receive training to perform the repair. This training should be from either the manufacturer or from an industry-accepted training provider.

The ASTM consensus standard specifies that the manufacturer of the aircraft shall determine what is a major repair and major alteration. The same consensus standard requires the manufacturer to determine what additional training is required for the Light Sport Repairman with a Maintenance Rating (LSRM) to be qualified to perform those tasks. The LSRM should contact the manufacturer to determine if the major repair or major alteration is authorized, and determine if additional training is needed.

Can An A&P Perform Major Repairs On SLSA?

It is up to each manufacturer to dictate who can – and who cannot – do work on your SLSA. If the authorization for a major repair or alteration allows an airframe and powerplant mechanic (A&P) to complete a major repair, the mechanic must remember that when working on SLSA, the aircraft's consensus standard, maintenance manual, and instructions for continued airworthiness must be used instead of TC data. Furthermore, on special light sport aircraft, both Part 43 and

the general privileges and limitations of FAR section 65.81, still apply. To satisfy the requirements of § 65.81, the mechanic must be able to prove to an FAA inspector that he or she performed that work at an earlier date, was trained to do the work, or was supervised by another mechanic or repairman performing that task.

The Rotax 912 is by far the most popular engine used in most SLSA. The real problem is that an A&P mechanic is required to have Rotax factory training to perform any work on Rotax engines. These mechanics are not allowed to service or maintain an engine on an SLSA, unless appropriately trained to do so. As of this writing, there are still relatively few mechanics approved to work on the Rotax 912 in the U.S.

In order to add new equipment (or to modify anything) on an SLSA, the maintenance technician or owner of the SLSA must make a specific request to the manufacturer. It is completely up to the manufacturer to allow anyone to install the equipment (or make the modification). There

is no FAA involvement. If the manufacturer allows an owner to install avionics under the supervision of a mechanic, it is important to note that this must be an A&P since a LSRM cannot supervise.

If your SLSA has a type certificated engine or Technical Standards Order (TSO) product installed, major repairs and major alterations on these FAA-approved products will require compliance with the recording requirements to document such changes contained in Part 43.

The bottom line is that the term “major repair” means any task, which is excluded from the manufacturer’s maintenance manual. If the task is not in the manual, you must request written authorization from the manufacturer. For an SLSA, the aircraft manufacturer in writing must approve any modification, including installation of new avionics or any propeller changes, and the documentation must be included in the logbook records.

For more information or to inquire

about the Light Sport Repairman Training course, contact Rainbow Aviation Services or visit www.rainbowaviation.com.

EDITOR'S NOTE: Carol Carpenter is a Sport Pilot Instructor, Private Pilot, FAA FAAS Team Representative, and a freelance aviation columnist. She is also an instructor for the Light Sport Repairman Courses and co-owner of Rainbow Aviation Service in Corning, California, where she and her husband have a full-service FBO. The Carpenters have co-authored two books: *Sport Pilot Airplane: A Complete Guide & A Professional Approach To Ultralights*.

References:

F2339-06(2009) **F2483-05 Standard Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft**/ ASTM International, West Conshohocken, PA, 2009, www.astm.org.

F 2279 **Standard Practice for Quality Assurance in the Manufacture of Fixed-Wing Light Sport Aircraft LSA** / ASTM International, West Conshohocken, PA, 2009, www.astm.org.

AC65-32 – Certification of Repairman (Light-Sport Aircraft) <http://rgl.faa.gov/>, click Advisory Circular and search AC65-32

LSA Repairman Certificate: eligibility, privileges and limits 14 CFR section 65.107

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