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Standard Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft¹

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1. Scope

1.1 This practice provides guidelines for the qualifications to accomplish the various levels of maintenance on U.S.-certificated experimental and special light sport aircraft. In addition, it provides the content and structure of maintenance manuals for aircraft and their components that are operated as light sport aircraft.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

F2241 Specification for Continued Airworthiness System for Powered Parachute Aircraft

F2244 Specification for Design and Performance Requirements for Powered Parachute Aircraft

F2245 Specification for Design and Performance of a Light Sport Airplane

F2295 Practice for Continued Operational Safety Monitoring of a Light Sport Aircraft

F2352 Specification for Design and Performance of Light Sport Gyroplane Aircraft

F2415 Practice for Continued Airworthiness System for Light Sport Gyroplane Aircraft

2.2 Federal Standards:³

14 CFR Part 21.190 Issue of a Special Airworthiness Certificate for a Light-Sport Category Aircraft

14 CFR Part 43 Maintenance, Preventive Maintenance, Rebuilding, and Alteration

14 CFR Part 65 Certification: Airmen Other Than Flight Crewmembers

3. Terminology

3.1 Definitions:

3.1.1 *annual condition inspection*—detailed inspection accomplished once a year on a LSA in accordance with instructions provided in the maintenance manual supplied with the aircraft. The purpose of the inspection is to look for any wear, corrosion, or damage that would cause an aircraft to not be in a condition for safe operation.

3.1.2 *A&P*—airframe and powerplant mechanic as defined by 14 CFR Part 65 in the U.S. or equivalent certification in other countries.

3.1.3 *FAA*—United States Federal Aviation Administration.

3.1.4 *heavy maintenance*—any maintenance, inspection, repair, or alteration a manufacturer has designated that requires specialized training, equipment, or facilities.

3.1.5 *line maintenance*—any repair, maintenance, scheduled checks, servicing, inspections, or alterations not considered heavy maintenance that is approved by the manufacturer and is specified in the manufacturer's maintenance manual.

3.1.6 *LSA (light sport aircraft)*—aircraft designed in accordance with ASTM standards under the jurisdiction of Committee F37 Light Sport Aircraft, for example, Specification **F2244** for powered parachutes, Specification **F2245** for airplanes, and Specification **F2352** for gyroplanes.

3.1.7 *LSA repairman inspection*—U.S. FAA-certificated repairman (light sport aircraft) with an inspection rating as defined by 14 CFR Part 65, authorized to perform the annual condition inspection on experimental light sport aircraft, or an equivalent rating issued by other civil aviation authorities.

3.1.7.1 *Discussion*—Experimental LSA do not require the individual performing maintenance to hold any FAA airman certificate in the U.S.

3.1.8 *LSA repairman maintenance*—U.S. FAA-certificated repairman (light sport aircraft) with a maintenance rating as defined by 14 CFR Part 65, authorized to perform line maintenance on aircraft certificated as special LSA aircraft.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

Authorized to perform the annual condition/100-h inspection on an LSA, or an equivalent rating issued by other civil aviation authorities.

3.1.9 *maintenance manual(s)*—manual provided by an LSA manufacturer or supplier that specifies all maintenance, repairs, and alterations authorized by the manufacturer.

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.

3.1.13 *overhaul*—maintenance, inspection, repair, or alterations that are only to be accomplished by the original manufacturer or a facility approved by the original manufacturer of the product.

3.1.14 *overhaul facility*—facility specifically authorized by the aircraft or component manufacturer to overhaul the product originally produced by that manufacturer.

3.1.15 *repair facility*—facility specifically authorized by the aircraft or component manufacturer to repair the product originally produced by that manufacturer.

3.1.16 *14 CFR*—Code of Federal Regulations Title 14 Aeronautics and Space also known as the “FARs” or Federal Aviation Regulations.

3.1.17 *100-h inspection*—same as an *annual condition inspection*, except the interval of inspection is 100 h of operation instead of 12 calendar months. This inspection is utilized when the LSA is being used for commercial operations such as flight instruction or rental, or both.

4. Significance and Use

4.1 The purpose of this practice is to provide guidance to owners, mechanics, airports, regulatory officials, and aircraft and component manufacturers who may accomplish maintenance, repairs, and alterations on a light sport aircraft. In addition, this practice covers the format and content of maintenance manuals and instructions for the maintenance, repair, and alteration of an LSA.

5. Aircraft Maintenance Manual

NOTE 1—This practice provides the information needed to comply with the requirement of what the maintenance manual will contain. Manufacturers of SLSA and ELSA Kits for sale in the U.S. are required to provide a maintenance manual for each aircraft in accordance with 14 CFR Part 21.190. These manuals do not require any type of approval from the FAA or other government entity; however, the regulations do require the manual to be developed in accordance with industry consensus standards.

5.1 *Format*—The maintenance manual shall have the following sections:

5.1.1 *General*—Listings of general specifications, capacities, and instructions on ground handling, servicing, and lubrication such as:

- 5.1.1.1 Equipment list,
- 5.1.1.2 Sources to purchase parts,
- 5.1.1.3 List of disposable replacement parts, for example, air filters, fuel filters, oil filters, and tires,
- 5.1.1.4 Engine specifications,
- 5.1.1.5 Weight and balance information,
- 5.1.1.6 Tire inflation pressures,
- 5.1.1.7 Approved oils and capacities,
- 5.1.1.8 Recommended fastener torque values,
- 5.1.1.9 General safety information, and
- 5.1.1.10 Instructions for reporting possible safety of flight concerns found during inspection/maintenance.

5.1.2 *Inspections*—Instructions on and checklists for the completion of periodic and annual condition/100-h inspections, as appropriate.

5.1.3 *Structures*—A description of and instructions for the maintenance, repair, and alteration of the aircraft primary structures such as:

- 5.1.3.1 Wing (fixed, rotary, or inflatable),
- 5.1.3.2 Empennage (or cart),
- 5.1.3.3 Landing gear, and
- 5.1.3.4 Structural control surfaces, for example, elevator (if applicable).

5.1.4 *Engine*—A description of and instruction for the maintenance, repair, and overhaul of the aircraft’s engine if the aircraft is powered.

NOTE 2—An LSA manufacturer may defer to the engine manufacturer for the required maintenance, repair, and overhaul instructions.

5.1.5 *Fuel System*—A description of the system, schematic diagram, and instructions for the maintenance and repair of the aircraft fuel system, if a powered aircraft.

5.1.6 *Propeller*—A description of and instructions for the maintenance and repair of the propeller, if a powered aircraft.

NOTE 3—An LSA manufacturer may defer to the propeller manufacturer for the required maintenance, repair, and overhaul instructions.

5.1.7 *Utility Systems*—A description of the systems and instructions for the maintenance and repair of utility systems such as heating, vent, and air-conditioning, if installed.

5.1.8 *Instruments and Avionics*—A description of and instructions for the maintenance, repair, replacement, and installation of existing and additional instruments and avionics, as applicable.

5.1.9 *Electrical System*—A description of the system, schematic diagram, and instructions for the maintenance, repair, and alteration, as appropriate.

5.1.10 *Structural Repair*—A description of the structural repairs that are authorized without further consultation with the manufacturer.

5.1.11 *Painting and Coatings*—A description for the repair, replacement, or alteration, or a combination thereof, of paint or coatings used on the aircraft.

5.1.12 *Revisions*—A section, such as a change history table, for the listing of any revisions to the maintenance manual by the manufacturer.

5.1.13 *Feedback Form*—A form for the aircraft owner or maintainer to provide notification to the manufacturer about

issues and anomalies identified during the operation or maintenance of the aircraft or in the content of the manual.

5.2 *Inspection, Repair, and Alterations*—Each of the inspections, repairs, and alterations outlined in the maintenance manual shall specifically list:

- (1) Recommended special tools to accomplish the task,
- (2) The parts needed to perform the task,
- (3) Type of maintenance, for example, line, heavy, or overhaul,
- (4) The level of certification needed to accomplish the task, for example, owner, A&P, repairman (light sport aircraft) inspection, and repair station,
- (5) Detailed instructions and diagrams as needed to perform the task, and
- (6) Method to test/inspect to verify the task was accomplished properly.

5.2.1 *Repairs and Alterations*—Manufacturers may refer to other repair and alteration manuals such as the FAA’s AC for the detailed instructions to accomplish tasks outlined in the maintenance manual.

5.3 *Level of Certification*—When listing the level of certification needed to perform a task, the manufacturer shall use one of the following descriptors.

5.3.1 *Owner*—Items that can be expected to be completed by a responsible owner who holds a pilot certificate but who has not received any specific authorized training.

NOTE 4—FAA regulations authorize SLSA aircraft owners who hold at least a sport pilot certificate to perform maintenance as outlined in 14 CFR Part 43.

5.3.2 *LSA Repairman Inspection*—Items that can be expected to be completed on an ELSA by a responsible owner, which holds an FAA repairman certificate (light sport aircraft), with an inspection rating or equivalent.

5.3.3 *LSA Repairman Maintenance*—Items that can be expected to be completed on a SLSA by a responsible individual, which holds a FAA repairman certificate (light sport aircraft), with a maintenance rating or equivalent.

5.3.4 *A&P*—Items that can be expected to be completed by a responsible individual who holds a mechanic certificate with airframe or powerplant ratings, or both, or equivalent.

5.3.5 *Task Specific*—Items that can be expected to be completed by a responsible individual who holds either a mechanic certificate or a repairman certificate and has received task specific training to perform the task.

5.3.5.1 When specifying the “task specific” level of certification, the manufacturer must also specify the specific training required.

5.3.6 Multiple descriptors and modifiers may be used. For example, a manufacturer may list under level of certification required for the replacement of a piston engine valve, “A&P or LSA Repairman Maintenance Task-Specific.”

6. Line Maintenance, Repairs, and Alterations

6.1 *Authorization to Perform*—The holder of an LSA repairman certificate with either an inspection or maintenance rating is generally considered the minimum level of certification to perform line maintenance of LSA.

NOTE 5—Many of the tasks listed are also authorized by the FAA to be performed by the owner of the SLSA who holds a sport pilot certificate. The examples listed below should not be considered as restrictions against the performance of the tasks by an owner that is authorized to perform said task by the FAA.

6.2 *Typical Tasks Considered as Line Maintenance for LSA’s Include:*

- 6.2.1 100-h inspection,
- 6.2.2 Annual condition inspection,
- 6.2.3 Servicing of fluids,
- 6.2.4 Removal and replacement of components for which instructions are provided in the maintenance manual such as:
 - 6.2.4.1 Fuel pumps,
 - 6.2.4.2 Batteries,
 - 6.2.4.3 Instruments, switches, lights, and circuit breakers,
 - 6.2.4.4 Starters/generators/alternators,
 - 6.2.4.5 Exhaust manifolds/mufflers,
 - 6.2.4.6 Wheel and brake assemblies,
 - 6.2.4.7 Propellers,
 - 6.2.4.8 Sparkplugs, ignition wires, and electronic ignition models/components limited to the use of mechanical connections,
 - 6.2.4.9 Hoses and lines,
 - 6.2.4.10 Sailcloth covering,
 - 6.2.4.11 Ballistic recovery system,
 - 6.2.4.12 Floats, and
 - 6.2.4.13 Skis.
- 6.2.5 Repair of components and structure for which instructions are provided in the maintenance manual and which do not require additional specialized training, such as:
 - 6.2.5.1 Patching of a hole in a fabric, metal, or composite non-structural component, and
 - 6.2.5.2 Stop-drilling of cracks.
- 6.2.6 Alterations for which specific instruction are provided in the maintenance manual, such as:
 - 6.2.6.1 Installation of a communications radio, transponder, GPS, and antenna,
 - 6.2.6.2 Installation of a strobe light system, and
 - 6.2.6.3 Compliance with a manufacturer service directive when the repairman is listed as an authorized person to accomplish the alteration.

7. Heavy Maintenance, Repairs, and Alterations

7.1 *Authorization to Perform*—The holder of a mechanic certificate with airframe or powerplant rating(s), or both, or an LSA Repairman maintenance that has received additional task specific training for the function to be performed is generally considered the minimum level of certification to perform heavy maintenance of LSA.

7.2 *Typical Tasks Considered as Heavy Maintenance for SLSA’s Include:*

- 7.2.1 Removal and replacement of components for which instructions are provided in the maintenance manual or service directive instructions, such as:
 - 7.2.1.1 Complete engine removal and reinstallation in support of an engine overhaul or to install a new engine,
 - 7.2.1.2 Remove and replacement of engine cylinders, pistons, or valve assemblies, or a combination thereof,
 - 7.2.1.3 Primary flight control cables/components, and