Designation: F3035 – 22

Standard Practice for Production Acceptance in the Manufacture of a Fixed Wing Light Sport Aircraft[1]

This standard is issued under the fixed designation F3035; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 The following requirements apply for the manufacture of fixed wing aircraft, including gliders. This practice includes the production acceptance test requirements.

1.2 This practice applies to aircraft seeking civil aviation authority approval, in the form of flight certificates, flight permits, or other like documentation.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*

F2245 Specification for Design and Performance of a Light Sport Airplane

F2564 Specification for Design and Performance of a Light Sport Glider

F2972 Specification for Light Sport Aircraft Manufacturer's Quality Assurance System

3. Terminology

3.1 *Definitions:*

3.1.1 *design and performance specification, n*—used herein to refer to Specifications F2245 and F2564.

3.1.2 *LSA airplane (light sport aircraft airplane), n*—powered aircraft designed in accordance with Specification F2245 that is manufactured and delivered ready to fly.

3.1.3 *LSA glider (light sport aircraft glider), n*—aircraft designed in accordance with Specification F2564 that is manufactured and delivered ready to fly.

3.1.4 *LSA kit (light sport aircraft kit), n*—aircraft designed in accordance with Specifications F2245 or F2564 that is manufactured and delivered as a kit.

3.2 *Abbreviations:*

3.2.1 *POH*—Pilot's Operating Handbook

3.2.2 *LSA*—light sport aircraft

4. Significance and Use

4.1 The purpose of this practice is to provide the minimum requirements necessary for the establishment of a production acceptance program for a manufacturer of light sport aircraft.

4.2 The purpose of this specification is to provide the minimum requirements for the establishment of a ground and flight test program for verifying the initial production aircraft meets certain operational performance requirements that have been set forth by the manufacturer in its Pilot's Operating Handbook (POH).

4.3 In addition, this specification provides minimum requirements to verify that each subsequent production airplane has no obvious defects that would prevent the safe operation of the airplane.

4.4 All requirements given in this specification are to be performed in accordance with the manufacturer's Specification F2972-compliant quality assurance system requirements.

4.5 The following criteria should not be construed as requirements for specific features to be included on a LSA. When a requirement specifies a feature that does not exist on a LSA, the requirement does not apply.

5. Final Inspections

5.1 Manufacturer shall verify that all applicable production processes and documentation given in Section 6 of Specification F2972 exist or have been completed for the aircraft prior to conducting the following Production Acceptance procedures.

[1] This practice is under the jurisdiction of ASTM Committee F37 on Light Sport Aircraft and is the direct responsibility of Subcommittee F37.20 on Airplane.

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5.2 *LSA Kit*—Manufacturer shall verify and document the proper completion of the production process prior to the further distribution of any LSA kit or subsystem kit. Manufacturer shall provide the builder of a LSA kit with appropriate Production Acceptance Ground Check and Flight Test Procedures, as described below.

6. Ground Testing

6.1 *LSA Airplane and LSA Glider*—Manufacturer shall verify the proper completion of the production process prior to the further distribution of any LSA. The following ground check procedures shall be conducted and documented for each LSA.

6.2 *Ground Check*—Prior to flight testing, the manufacturer shall conduct a thorough ground inspection of each LSA produced to verify at least the following:

6.2.1 *Weight and Balance*—Empty weight and proper center of gravity location have been calculated and verified to be within limits, and that a weight and balance report has been completed for the airplane in accordance with a documented and approved procedure.

6.2.2 *Systems Check*—The proper function of all switches and circuits, instrumentation, brakes, and any other appropriate systems shall be verified.

6.2.3 *Flight Controls Check*—All flight controls shall be checked for smooth and proper function and proper maximum deflections as specified by the manufacturer. Control system connections and safeties shall be checked and verified intact.

6.2.4 *Seats and Safety Belts*—Seats and occupant restraint systems shall be checked for conformity and visual defects.

6.2.5 *Powerplant Check*—Engine or Electric Propulsion Unit (EPU) checks and procedures shall be performed to verify:

6.2.5.1 Proper installation;

6.2.5.2 Proper servicing of all engine fluids;

6.2.5.3 No apparent fuel, oil, or coolant leaks, as appropriate;

6.2.5.4 Propeller installation and pitch adjustment, as applicable;

6.2.5.5 Performance of an engine "run-in" with adjustments, as required;

6.2.5.6 Tachometer indicates engine idle RPM and maximum static RPM is within manufacturer's published limits;

6.2.5.7 Proper function of engine or EPU instrumentation;

6.2.5.8 Proper function of ignition system(s);

6.2.5.9 Proper function of induction heating system; and

6.2.5.10 For powered LSA gliders, proper retraction and extension of the engine.

6.2.6 *Placards Check*—The aircraft shall be checked to verify:

6.2.6.1 That all required ASTM and CAA compliant placards, switch, and instrument markings are in place; and

6.2.6.2 That all placards also match the POH.

6.2.7 *Preflight Inspection*—The following shall be verified:

6.2.7.1 All required documentation is on board;

6.2.7.2 All visible surfaces are free of deformation, distortion, or other evidence of failure or damage;

6.2.7.3 Inspection of all visible fittings and connections for defective or insecure attachment; and

6.2.7.4 Complete walk-around inspection in accordance with the POH.

6.3 *Taxi Test*—After completion of the Ground Check, a Taxi Test shall be conducted to verify:

6.3.1 Brake function,

6.3.2 Landing gear tracking and steering.

6.3.3 If a compass is installed, it must be calibrated with consideration of magnetic interference of aircraft systems.

7. Flight Testing

7.1 *LSA Airplane and LSA Glider*—Manufacturer shall verify the proper completion of the production process prior to the further distribution of any LSA. The following flight test procedures shall be conducted and documented for each LSA.

7.2 *Flight Test for LSA Airplanes*—After completion of the Taxi Test, a flight test shall be conducted.

7.2.1 Safe flight operation of each completed LSA airplane shall be verified to include acceptable handling and control characteristics, stall characteristics, engine operation, airspeed indications, and overall suitability for normal flight in accordance with the POH. The flight test procedure, at a minimum, shall include recorded verification of the following:

7.2.1.1 Takeoff runway wind, outside air temperature, and pressure altitude;

7.2.1.2 Verification that takeoff distance meets manufacturer's POH;

7.2.1.3 Verification that the climb rate meets or exceeds the manufacturer's published specification;

7.2.1.4 Appropriate response to flight controls in all configurations;

7.2.1.5 Wings-level idle-power stall speed in all configurations, including verification of appropriate stall warning and stall recovery characteristics;

7.2.1.6 Verification of no unusual performance or handling characteristics; and

7.2.1.7 Proper engine operation.

7.3 *Flight Test for LSA Gliders*—After completion of the taxi test, a flight test shall be conducted. Safe flight operation of each completed LSA glider shall be verified to include acceptable handling and control characteristics, stall characteristics, airspeed indications, and overall suitability for normal flight in accordance with the POH.

7.3.1 The flight test procedure, at a minimum, shall include recorded verification of the following:

7.3.1.1 Wings-level stall speed in all configurations, including verification of appropriate stall warning and stall recovery characteristics;

7.3.1.2 Appropriate response to flight controls in all configurations, including, if allowed, winch launching and aerotowing; and

7.3.1.3 Verification of no unusual performance or handling characteristics.

7.3.2 In addition, for powered LSA gliders, the flight test procedure shall also include the recorded verification of the following: