

第 1 部分 概述

SECTION 1 GENERAL

I. 概述/General

1. 机型/Model Merlin M-1
2. 类别/Category: 轻型运动类/ Light Sports Aircraft Category (LSA)
3. 申请日期/Date of Application: 2016 年 06 月 27 日/27 Jun 2016

II. 审定基础/Certification Basis

CAAC审定基础是: /CAAC certification basis is:

1. CCAR-21-R4的第21.26条, 型号合格证的颁发: 轻型运动类航空器/Section 21.26 of CCAR-21-R4, issue of type certificate: light sport aircraft;
2. 以下适用的ASTM标准/The following applicable ASTM Standards:
 - F2245-14 轻型运动飞机设计和性能标准规范/Standard Specification for Design and Performance of a Light Sport Airplane;
 - F2295-10 轻型运动飞机持续运行安全监控标准实施/ Standard Practice for Continued Operational Safety Monitoring of a Light Sport Aircraft;
 - F2339-06 轻型运动飞机火花点火活塞发动机设计和制造标准实施/ Standard Practice for Design and Manufacture of Reciprocating Spark Ignition Engines for Light Sport Aircraft;
 - F2483-12 轻型运动飞机维修通则和维修手册编制标准实施/ Standard Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft;
 - F2506-13 轻型运动飞机定距或地面可调螺旋桨设计和试验标准规范/ Standard Specification for Design and Testing of Light Sport Aircraft Propellers;
 - F2746-14 轻型运动飞机驾驶员操作手册 (POH) 操作规范/ Standard Specification for Pilot's Operating Handbook (POH) for Light Sport Airplane;

F2972-14 轻型运动飞机制造商质量保证系统标准规范/ Standard Specification for Light Sport Aircraft Manufacturer's Quality Assurance System;

F3035-13 固定翼轻型运动飞机制造生产接收标准实施/ Standard Practice for Production Acceptance in the Manufacturer of a Fixed Wing Light Sport Aircraft.

3. 专用条件/Special Conditions:

无/None;

4. 等效安全/Equivalent Safety Findings:

无/None;

5. 豁免/Exemptions:

无/None

6. CAAC的专用要求/CAAC special requirements

6.1 与运行有关的要求/requirements related to operation :

(1) 高度表应以公制单位指示/The altimeter should be indicated in metric units;

(2) 按照 CCAR21 要求, 下列标记和标牌应至少有中文表述/According to CCAR21 requirements, the following markings and placards should be at least in Chinese:

- 机上所有对旅客进行的提示、警告和通知的文字标记和标牌/ Markings and placards for passenger usage;
- 机上所有向旅客或者机外营救人员指示应急出口和门的位置以及开启方法的文字标记和标牌/ Markings and placards for passengers and rescue personal usage in case of emergency evacuation.

6.2 应在飞行员使用手册中规定发动机使用的最低燃油等级 (辛烷值 ≥ 95)。

The minimum fuel rate (min. RON 95) to be used for the engine shall be defined in the Pilot Operating Handbook.

第 2 部分 技术特征和使用限制

SECTION 2 Technical Characteristics and Operational Limitations

I. 设计技术特征/Design Technical Characteristics

1. 型号设计数据/Type Design Data

Merlin M-1 型飞机主图纸清单 B 版（编号 GAER-5000-MDL）2017 年 10 月 18 日。

Master Drawing List (MDL) GAER-5000-MDL, Revision B dated 18 October 2017 pertaining to the Merlin M-1 Configuration.

2. 机身详细资料/Airframe Details

类型/Type	上单翼，拉力螺旋桨/High Wing Tractor
座椅数/Number of Seats	2
结构材料/Construction Material	复合材料：环氧碳纤维机身-环氧玻璃钢纤维机翼/Composite: Carbon Fuselage - Fiberglass Wings VinylEster Epoxy
起落架/Undercarriage	前三点式固定/Fixed: Tricycle
增升装置/High Lift Devices	襟翼/Flaps
纵向操纵/Longitudinal Control	升降舵/Elevator
横向操纵/Lateral Control	副翼/Ailerons
地面操纵/Steering on the ground	差动刹车协调转弯/Individual Braking
刹车/Braking	主轮同时刹车/Main Wheel Brakes Operating Together

3. 运行类别和使用限制/Type of Operation and Operating Limitations

运行类别/Type of Operation	昼间非特技目视飞行/Day VFR Non-Aerobatic Operation Only
------------------------	--

批准的机动/ Approved Manoeuvre	正常飞行中任何机动包括/Any manoeuvre necessary for normal flying including: -失速(除动态失速和加速失速外)/Stalling (except for dynamic or accelerated stall) -不超过 60° 缓八字飞行/ Lazy eights with an angle of bank not more than 60° -急转跃升/Chandelles -不超过 60° 的急转弯和小机动/Steep turns and similar maneuvers with an angle of bank not more than 60°
禁止的机动/Prohibited maneuvers	-特技飞行/ Aerobatics -故意的尾旋/ Intentional spinning -超过 60°侧滑角机动飞行/Flight maneuvers with an angle of bank more than 60° -大于 30°俯仰角机动飞行/Flight maneuvers with pitch attitudes greater than 30°

4. 重量平衡/Weight and Balance

最大起飞重量/Maximum Take-Off Weight	1320 lbs (600 kg)
最大着陆重量/Maximum Landing Weight	1320 lbs (600 kg)
重心前限/Most Forward CG	71 in (1.803m) aft of propeller flange
重心后限/Most rearward Position	75.26 in (1.91 m) aft of propeller flange
飞机基准/Aircraft Datum	100 in (2.54 m) forward of propeller flange
座椅站位/ Seat Station	71.4 in (1.81 m) inches aft of propeller flange
行李区站位/Baggage Zone Station	100 in (2.54 m) aft of propeller flange
机翼油箱站位/Fuel Station-Fuel Tank	99.75 in (2.53 m) aft of propeller flange

5. 测平措施/Levelling Means

纵向/Longitudinal	Spirit level placed across lower door frame
-----------------	---

横向/Lateral

Spirit level placed across main spar carry through

6. 动力装置数据/Powerplant Data

发动机制造商/Engine Manufacturer

ROTAX

发动机型号/Engine Model

912iS Sport

最低燃油等级/Minimum Fuel Grade

辛烷值不低于 95 的车用无铅汽油（或抗暴指数不小于 91）；欧洲标准 EN228 Super & Super Plus 航空汽油 100LL

MOGAS: Min. RON 95 / Min. AKI 91 Unleaded; EN 228 Super & Super Plus

AVGAS: 100LL (ASTM D910)

发动机滑油/ Engine Oil

AEROSHELL Oil Sport Plus 4

燃油总容量/Total Fuel Capacity:

90.85 升/ 24 gallons

可用燃油量/Usable Fuel Capacity:

87.06 升/ 23 gallons

滑油量/Oil Capacity:

3 升/ 3 liters

6.1. 起飞操纵/Take-Off Operation

最大起飞功率/Maximum Take-off Power

73.5kw(100hp) at 5800 rpm (max.5 min)

最大连续功率/Maximum Continuous Power

72kw(97hp) at 5500 rpm

慢车转速/Idle

1400rpm

6.2. 温度限制/Temperature Limitations

汽缸头温度/Cylinder Head Temperature

最高 120°C (最大 5 分钟)/ Max. 120°C (Max. 5min)

滑油温度/Oil Temperature

最高 130°C(最大 5 分钟)/ Max. 130°C (Max. 5min)

最低 50°C / Min. 50°C

7. 螺旋桨数据/Propeller Data

制造商/Manufacturer

Sensenich

型号/Model

2A0R5R70E-0

桨叶数/Number of Blades

2

直径/Diameter	70 inches(1524 mm)
材料/Material	碳纤维/ Carbon fiber
桨距调定值/Pitch Setting	Nominal Pitch: Setting #3
最大螺旋桨转速/Maximum Propeller Rotational Speed	5800 rpm engine speed

8. 飞机性能概述/Summary of Performance on aircraft

不可超越速度/ V_{NE} , Never Exceed Speed ..	120 KIAS
最大结构巡航速度/Maximum Structural Cruising Speed	108 KIAS
机动速度/Manoeuvring Speed	90 KIAS At 1320 lbs.(600 kg)
襟翼展态速度/Flaps Extend Speed	75 KIAS
起飞安全速度/Take-Off Safety Speed	45 KIAS
最终进近速度/Final Approach Speed	50 KIAS
V_H 最大平飞速度（海平面、最大起飞重量） /	
V_H Max Level Flight Speed @ Sea Level, MTOW	104 KIAS
V_C 巡航速度（75%功率、最大起飞重量） /	
V_C Cruising Speed at 75% Power & MTOW	102 KIAS
失速速度（无动力、襟翼收起） /	
Stalling Speed Power Off Flaps Up	45 KIAS
失速速度（无动力、襟翼全放下） /	
Stalling Speed Power Off Flaps Full Down	38 KIAS
V_D 设计俯冲速度/ V_D , Design Dive Speed	146 KIAS
V_{DF} 俯冲演示速度/ V_{DF} , Demonstrated Dive Speed	135 KIAS
起飞距离/Take-Off Distance	
地面滑跑距离/Ground Roll Distance	490 ft (150 m)
总起飞距离/Total Take-Off Distance to 15m	1314 ft (400 m)
着陆距离/Landing Distance	
地面滑跑距离/Ground Roll Distance	600 ft (182 m)

总着陆距离/Total Landing Distance from 15m 1420 ft (432 m)

起飞或着陆时最大侧风速度/

Maximum Crosswind Component for take-off and landing 19 kts

最大运行高度/Operating Altitude

密度高度/Maximum density altitude. 16000 ft (4876 m)

9. 操纵面偏转范围/Control Surface Deflection

操纵面偏转范围的总容差为 $\pm 1.0^\circ$ /General Tolerance on Control Surface Deflection is $\pm 1.0^\circ$

操纵面/Control Surface	偏转测量结果/Deflection Measured Results
---------------------	------------------------------------

升降舵上偏/Elevator Up	30.0°
-------------------	-------

升降舵下偏/Elevator Down	20.0°
---------------------	-------

左副翼上偏/LH Aileron Up	20.0°
---------------------	-------

左副翼下偏/LH Aileron Down	15.0°
-----------------------	-------

右副翼上偏/RH Aileron Up	20.0°
---------------------	-------

右副翼下偏/RH Aileron Down	15.0°
-----------------------	-------

左襟翼第一行程（在根部测量）

LH Flap 1st Stage Measured at Root	15°
------------------------------------	-----

左襟翼第二行程（在根部测量）

LH Flap 2nd Stage Measured at Root	30°
------------------------------------	-----

右襟翼第一行程（在根部测量）

RH Flap 1st Stage Measured at Root	15°
------------------------------------	-----

右襟翼第二行程（在根部测量）

RH Flap 2nd Stage Measured at Root	30°
------------------------------------	-----

方向舵右偏/Rudder Right	25°
--------------------	-----

方向舵左偏/Rudder Left	25°
-------------------	-----

10. 操纵面配平/Control Surface Balancing

操纵面/Control Surface

铰链力矩限制/Limiting Hinge Moment

方向舵/Rudder

15 ft-lbs (2.07 kg-m)

副翼/Aileron

19 ft-lbs (2.62 kg-m)

升降舵/Elevator

21 ft-lbs (2.90 kg-m)

11. 飞机尺寸/AIRCRAFT DIMENSIONS

翼展/Wingspan, b

31 ft 8 in (9.65 m)

平均弦长/Mean chord, c

4.17 ft (1.27 m)

翼面积/Wing Area, S

132 ft² (12.26 m²)**12. 设备和标牌/Equipments and Placards**

飞行员使用手册所要求的设备和标牌必须安装。

Equipments and placards required by the applicable Pilot's Operating Handbook must be installed.

13. 最小飞行机组/Minimum Flight Crew

1 名飞行员/1 Pilot

14. 最大旅客座位数/ Maximum Passenger Seating Capacity

1

II. 运行和使用说明/Operating and Service Instructions**1. 飞行员使用手册/ Pilot's Operating Handbook**

飞行员使用手册 QAM-101 (B 版) 及其补充和后续更改版本。

Pilot's Operating Handbook (Document QAM-101 Rev B, and supplements), or later approved revisions.

2. 维护检查文件/Instructions for Maintenance and Inspection

飞行员使用手册 QAM-101(B 版) 及其补充和后续更改版本/

Pilot's Operating Handbook QAM-101(Rev.B), or Later Approved Revisions.

维护手册 QAM-102(B 版)和后续更改版本/

The Maintenance Manual QAM-102(Rev.B), or Later Approved Revisions.

Rotax 发动机维护手册 Part No. 898742 和后续更改版本/

Rotax Engine Maintenance Manual Part No. 898742, or Later Approved Revisions.

Rotax912is 发动机安装手册 No.898647(Rev.3 版),和后续更改版本/.

Rotax912is Installation Manual, Part No.898647 (Rev. 3), or Later Approved Revisions.

Sensenich 螺旋桨安装和使用手册 DOC#:2A0 Installation Manual (Rev.d) ,和后续更改版本/.

Sensenich Propeller Installation and Operation Manual.DOC#:2A0 Istallation Manual (Rev.d), or
Later Approved Revisions.

3. 产品序列号/Product Serial Number

交付中国产品序列号为 9001 及其后续序号/ Serial Number of aircraft delieeved to China is 9001
and later.

III 备注/ NOTES

备注 1/ Note 1:

维修计划文件见 Merlin M-1 型飞机维护手册 QAM-102(B 版)和后续更改版本。/The maintenance
schedule for the Merlin M-1 is that specified in the Aircraft Maintenance Manual QAM-102(Rev.B)
or later approved revisions.

备注 2 /Note 2:

强制检查见 Merlin M-1 型飞机维护手册 QAM-102(B 版)和后续更改版本的适航限制部分。/
Mandatory inspections are contained in the inspection section of the Merlin M-1 Aircraft
Maintenance Manual QAM-102(Rev.B) or later approved revisions.

备注 3 /Note 3:

Glasair Aviation USA LLC 公司将把交付中国的飞机的重大构型变化通知 CAAC。/ Glasair Aviation
USA LLC will notify CAAC of major configuration changes for the aircraft deliveredd to China.