

**型号认可证数据单**  
**THE VALIDATION DATA SHEET**

编号/No.: VTC0027E

版次/Revision: 0

型号/Type:

TIO-540-AA1AD

TIO-540-A2C

批准人/Approved by:

张红鹰

日期/Date: 2010-3-15

本数据单是型号认可证（编号 VTC0027E）的组成部分，它规定了符合中国民用航空局的适航要求所颁发此型号认可证的产品状态和限制。

This data sheet, which is a part of Validation Type Certificate (No: VTC0027E), prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Chinese Civil Aviation Regulation.

**型号认可证持有人 / Validation of Type Certificate Holder:**

莱康明发动机公司，Avco运行部 / Lycoming Engines, An operating Division of Avco Corporation

威廉斯波特，宾夕法尼亚州 17701 / Williamsport, Pennsylvania 17701

**有效页清单/List of Effective Page**

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| 版次/Revision: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# 第1部分 概述

## SECTION 1 GENERAL

### 1. CAAC 认可数据单和型号合格证数据单

#### CAAC Validation Data Sheet and Type Certificate Data Sheet

|               | 中国民用航空总局认可数据单号、版次和颁发日期<br>CAAC Validation Data Sheet Number, Revision and issuance date | 型号合格证数据单号、版次和颁发日期<br>Type Certificate Data Sheet Number, Revision and issuance date               |
|---------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 当前<br>Current | VTC0027E, 版次0,<br>颁发日期: 2010年3月15日                                                      | No.E14EA, Revision 21,<br>Date of Issue: May 8 <sup>th</sup> , 2008<br>E14EA, 第21版<br>2008年5月8日颁发 |
| 历史<br>History | 无<br>None                                                                               | 无<br>None                                                                                         |

### 2. 类别/Category: 发动机/Engine

### 3. 认可当局/Validation Authority: 中国民用航空局/CAAC

审定当局/Certifying Authority: 美国联邦航空局/FAA

### 4. 型号合格证持有人/Type Certificate Holder:

莱康明发动机公司, Avco运行部 / Lycoming Engines, An operating Division of Avco Corporation

威廉斯波特, 宾夕法尼亚州 17701 / Williamsport, Pennsylvania 17701

### 6. ETOPS: 不适用/N/A

### 7. CAAC专用条件/CAAC Special Requirements: 无/NONE

## 第2部分 数据单

### SECTION 2 DATA SHEET

| 型号<br>Model                                                                                                                                           | 莱康明<br>Lycoming                                                                                 | TIO-540-AA1AD        | TIO-540-A2C |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------|-------------|
| 6HOA 型直接驱动涡轮增压额定功率（见注 4）<br>Type 6HOA Direct Drive Turbocharged Rating<br>(See Notes 4)                                                               |                                                                                                 |                      |             |
| 标准密度下，最大连续马力，转速，英寸汞柱<br>压力，临界海拔高度，英尺<br>Maximum continuous hp., rpm, in. Hg. at:<br>Standard density critical alt. ft.                                | 250-2575-32.5-15000                                                                             | 310-2575-42.0-15,000 |             |
| 标准密度下，最大连续马力，转速，英寸汞柱<br>压力，海平面高度，英尺<br>Maximum continuous hp., rpm, in. Hg. at:<br>Standard density sea level alt. ft.                                | 250-2575-32.5-S.L.                                                                              | 310-2575-40.0-S.L.   |             |
| 标准密度下，起飞（5分钟）马力-转速-英寸汞<br>柱压力-临界海拔高度，英尺<br>Takeoff (5 min.) hp., rpm, in. Hg. at:<br>Standard density critical alt. ft.                               | 250-2575-32.5-15000                                                                             | 300-2575-41.5-15,000 |             |
| 标准密度下，起飞（5 分钟）马力-转速-英寸<br>汞柱压力-海平面高度，英尺<br>Takeoff (5 min.) hp., rpm, in. Hg. at:<br>Standard density sea level alt., ft.                             | 250-2575-32.5-S.L.                                                                              | 310-2575-40.0-S.L.   |             |
| 燃油（最低品质航空汽油）<br>Fuel (minimum grade aviation gasoline)                                                                                                | 100/100LL                                                                                       | --                   |             |
| 润滑油（润滑油应该符合所列的说明书或之后<br>的修改版）<br>Lubricating oil (lubrication should conform to<br>the specification as listed or to subsequent<br>revisions thereto) | 莱康明 No. 301-F<br>服务说明书 No.1014<br>Lycoming<br>Spec. No. 301-F<br>Service Instruction<br>No.1014 | --                   |             |
| 气缸内经和行程，英寸<br>Bore and stroke, in.                                                                                                                    | 5.125×4.375                                                                                     | --                   |             |
| 气缸容积，立方英寸<br>Displacement, cu. in.                                                                                                                    | 541.5                                                                                           | 541.5                |             |
| 压缩比<br>Compression ratio                                                                                                                              | 8.00:1                                                                                          | 7.30:1               |             |
| 干重，磅<br>Weight (dry) lb.                                                                                                                              | 483                                                                                             | 511                  |             |

| 型号<br>Model                                                                                                                                     | 莱康明<br>Lycoming | TIO-540-AA1AD                                                            | TIO-540-A2C                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------|---------------------------------------------|
| 重心位置 (安装起动机和交流发电机)<br>C.G. location (with starter and alternator installed)<br>从螺旋桨安装法兰盘正面, 英寸<br>From front face of prop. Mounting flange, in. |                 | 23.05                                                                    | 22.22                                       |
| 重心位置 (安装起动机和交流发电机)<br>C.G. location (with starter and alternator installed)<br>远离曲轴中心线, 英寸<br>Off crankshaft C.L., in.                          |                 | 下方 2.20, 左方 0.67<br>2.20 below & 0.67 left                               | 下方 0.88, 右方 0.18<br>0.88 below & 0.18 right |
| 螺旋桨轴法兰盘, SAE A.S. 127<br>Propeller shaft flange, SAE A.S. 127                                                                                   |                 | 改进 2 型<br>Type 2 modified                                                | --                                          |
| 曲轴阻尼器 (扭转)<br>Crankshaft dampers (torsional)                                                                                                    |                 | 一个 5 阶, 一个 6 阶<br>One 5 <sup>th</sup> order<br>One 6 <sup>th</sup> order | --                                          |
| 燃油喷嘴<br>Fuel injection                                                                                                                          |                 | RSA-5AD1                                                                 | RSA-10AD1                                   |
| 涡轮增压器<br>Turbocharger                                                                                                                           |                 | TE0659                                                                   | --                                          |
| 点火装置, 双交流磁发电机<br>Ignition, dual                                                                                                                 |                 | TCM**<br>D6LN-3200                                                       | TCM**<br>S6LN-1208, S6LN-1209               |
| 点火时间 °BTC<br>Ignition timing °BTC                                                                                                               |                 | 20                                                                       | --                                          |
| 火花塞<br>Spark plugs                                                                                                                              |                 | 注 6<br>Note 6                                                            | --                                          |
| 滑油箱容积, 夸脱<br>Oil sump capacity, qt.                                                                                                             |                 | 12                                                                       | --                                          |
| 可用滑油, 夸脱 (20°抬头角度和低头角度)<br>Usable oil, qt. (20°nose up or down)                                                                                 |                 | 9 1/4                                                                    | --                                          |
| 适用注释<br>NOTES - as applicable                                                                                                                   |                 | 1-8                                                                      | --                                          |

-- 表示 “与前一型号相同。”

-- indicates “same as preceding model.”

审定基础:

Certification Basis:

| 规章和修正案<br>Regulations and<br>Amendments                                                                                             | 型号<br>Model   | 申请日期<br>Date of<br>Application   | TC E14EA 颁布/改版日期<br>Date Type Certificate<br>E14EA Issued/Revised |
|-------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------------|-------------------------------------------------------------------|
| 1956年7月15日生效的<br>CAR 13, 13-1, 13-2,<br>13-3, 13-4 修正案<br>CAR 13 effective June<br>15, 1956 as amended by<br>13-1, 13-2, 13-3, 13-4 | TIO-540-A2C   | 1970年11月17日<br>November 17, 1970 | 1971年1月6日<br>January 6, 1971                                      |
|                                                                                                                                     | TIO-540-AA1AD | 1985年2月20日<br>February 20, 1985  | 1985年6月25日<br>June 25, 1985                                       |

生产基础：生产许可证号 No. 3

Production basis: Production Certificate No. 3

注1. 最大许可温度：

NOTE 1. Maximum permissible temperature:

|                                                      |                                                                   |
|------------------------------------------------------|-------------------------------------------------------------------|
| 气缸盖（井型热电偶）<br>Cylinder head (well type thermocouple) | 500°F                                                             |
| 汽缸座<br>Cylinder base                                 | 注5<br>Note5                                                       |
| 滑油进口<br>Oil inlet                                    | 245°F                                                             |
| 排气<br>Exhaust gas                                    | 1650°F（涡轮进口位置见注4）<br>1650°F (See Note 4 for turbo inlet location) |
| 燃油喷嘴进气<br>Fuel injector inlet air                    | 400°F                                                             |
| 压气机温升<br>Compressor temperature rise                 | 不适用（见注4）<br>Not applicable (See Note 4)                           |

注2. 压力限制：

NOTE 2. Pressure limits:

| 型号<br>Model   | 燃油压力（p.s.i. 高于喷嘴<br>进口空气压力）<br>Fuel pressure (p.s.i. above<br>injector inlet air pressure) | 最小（p.s.i.）<br>Minimum<br>(p.s.i.) | 最大（p.s.i.）<br>Maximum<br>(p.s.i.) | 慢车（最小p.s.i.）<br>Idle (min p.s.i.) |
|---------------|--------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| TIO-540-AA1AD | 进口到燃油喷嘴<br>at inlet to fuel injector                                                       | 20                                | 65                                | 12                                |
| TIO-540-A2C   | 进口到燃油喷嘴<br>at inlet to fuel injector                                                       | 25                                | 55                                | 12                                |

| 总管压力（高度调整下全部累积）<br>Manifold Pressure (cumulative total with altitude adjustment) | 最大（英寸汞柱 绝对压力）<br>Maximum (in. Hg Abs) |
|----------------------------------------------------------------------------------|---------------------------------------|
| -AA1AD                                                                           | 38                                    |
| -A2C                                                                             | 46                                    |

| 滑油压力<br>Oil Pressure                            | 最大（p.s.i.）<br>Minimum (p.s.i.) | 最小（p.s.i.）<br>Maximum (p.s.i.) |
|-------------------------------------------------|--------------------------------|--------------------------------|
| 正常（全型号）<br>Normal (all models)                  | 55                             | 95                             |
| 慢车（全型号）<br>Idle (all models)                    | 25                             | --                             |
| 启动和热机（全型号）<br>Starting and warm-up (all models) | --                             | 115                            |
| 涡轮增压器排气背压<br>Turbocharger exhaust back pressure |                                | 0.5                            |

注3. 附件规定如下:

**NOTE 3. The following accessory provisions are available:**

| 附件<br>Accessory                     | -AA<br>1AD | -A2C | 面向驱动器衬<br>垫旋转(方向)<br>Rotating<br>Facing Drive<br>Pad | 曲轴速度比<br>Speed Ratio<br>to Crankshaft | 最大扭矩(英寸-磅)<br>Max. Torque<br>(in. lb.) |              | 最大悬垂力矩<br>(英寸-磅)<br>Max. Overhang<br>Moment<br>(in. -lb.) |
|-------------------------------------|------------|------|------------------------------------------------------|---------------------------------------|----------------------------------------|--------------|-----------------------------------------------------------|
|                                     |            |      |                                                      |                                       | 持续<br>Cont.                            | 静态<br>Static |                                                           |
| 起动机<br>Starter                      | *          | *    | CC                                                   | 16.556:1                              | --                                     | 450          | 150                                                       |
| 交流发电机<br>Alternator                 | *          | *    | C                                                    | 3.200:1                               | 60                                     | 120          | 175                                                       |
| 真空泵<br>Vacuum pump                  | *          | **   | CC                                                   | 1.300:1                               | 70                                     | 450          | 25                                                        |
| 液压泵<br>Hydraulic pump               | *          | --   | C                                                    | 1.300:1                               | 100                                    | 800          | 40                                                        |
| 液压泵<br>Hydraulic pump               | --         | **   | C                                                    | 1.385:1                               | 100                                    | 800          | 40                                                        |
| 转速计<br>Tachometer                   | *          | *    | C                                                    | 0.500:1                               | 7                                      | 50           | 5                                                         |
| 螺旋桨调节器<br>Propeller<br>governor***  | --         | *    | C                                                    | 0.895:1                               | 125                                    | 1200         | 25                                                        |
| 螺旋桨调节器<br>Propeller<br>governor**** | *          | *    | C                                                    | 0.947:1                               | 125                                    | 2200         | 25                                                        |
| 燃油泵<br>Fuel pump                    | *          | --   | C                                                    | 1.000:1                               | 25                                     | 450          | 25                                                        |
| 燃油泵<br>Fuel pump                    | --         | *    | CC                                                   | 1.000:1                               | 25                                     | 450          | 25                                                        |
| 氟利昂压缩机<br>Freon comp.               | **         | --   | C                                                    | 1.462:1                               | 受皮带限制<br>Limited by belt.              |              |                                                           |

"C" Clockwise, "CC" Counter Clockwise

"C" 顺时针方向, "CC" 逆时针方向

\* 标准的

\* Standard

\*\* 可选的

\*\* Optional

\*\*\* 窄板发动机

\*\*\* Narrow deck engines

\*\*\*\* 宽板发动机

\*\*\*\* Wide deck engines

注4. 涡轮增压器满足CAR13.116包容性要求, 且不需要外部保护。

**NOTE4. The Turbocharger meets the containment requirement of CAR 13.116 and does not require external protection.**

在进口位置测量排气温度, 见莱康明装配图纸 No.63232 (-A2C), 63546 (-AA1AD)。

Measure exhaust gas temperature at inlet location shown on Lycoming Drawing No.63232 (-A2C), 63546 (-AA1AD).

发动机的性能数据在莱康明曲线图 No.13195-B (-A2C), 13455 (-AA1AD)上显示。

Performance data for these engines are presented on Lycoming Curves No.13195-B (-A2C), 13455 (-AA1AD).

最大涡轮增压器转速不是根据温升而是用总管压力来控制。最大总管压力对高度曲线在莱康明曲线图 No.13196-C (-A2C), 13456 (-AA1AD)上显示。

Maximum turbocharger speed is now being governed by manifold pressure rather than temperature rise. Maximum manifold pressure versus altitude are presented on Lycoming Curves No.13196-C (-A2C), 13456 (-AA1AD).

注5. 气缸座温度限制并不适用在包含内部活塞冷却滑油喷嘴的发动机上。

**NOTE5. Cylinder base temperature limits are not applicable to engine models which incorporate internal piston cooling oil jets.**

注6. 批准使用在这些发动机上的火花塞被列在上一版本的德事隆·莱康明公司服务说明书 No. 1042上。

**NOTE 6. Spark plugs approved for use on these engines are listed in the latest revision of Textron Lycoming Service Instruction No. 1042.**

注7. 这些发动机包括如下相似点与不同点:

**NOTE 7. These engines incorporate the following similarities or difference:**

TIO-540-A1A 基础模型。六缸, 空气冷却, 水平对置, 直接驱动, 燃油喷射, 顶部排气, 包含内部活塞冷却滑油喷嘴的增压涡轮发动机。使用双叶片螺旋桨。

TIO-540-A1A Basic model. Six cylinder, air-cooled, horizontally-opposed, direct driver, fuel injected, top exhaust, turbocharged engine incorporating internal piston cooling oil jets. Uses two-blade propeller.

TIO-540-A1B 与-A1A型相似, 但装有快速温度响应的比重控制器。

TIO-540-A1B Similar to -A1A but has density controller with faster temperature response.

TIO-540-A2B 与-A1B型相似, 但装有可以配置双叶片或三叶片螺旋桨的螺旋桨法兰盘套筒。

TIO-540-A2B Similar to -A1B except has propeller flange bushings which accommodate either a two-blade or three-blade propeller.

TIO-540-A2C 与-A2B型相似, 但制动燃油消耗率增加到0.67/制动马力小时, 并且总管压力增加到40英寸汞柱。

TIO-540-A2C Similar to -A2B except BSFC is increased to .67/bhp-hr and the manifold pressure increased to 40.0 inches Hg.

TIO-540-C1A 与-A1A不同的是有较低的压缩比, 配重不同, 平行的气缸阀门。

TIO-540-C1A Differs from -A1A with lower compression ratio, different counterweights, and parallel valve cylinders.

TIO-540-E1A 与-C1A型相似,但是转速增加,采用不同的涡轮增压器控制设置和使用 Bendix S6LN-1227型磁电机代替S6LN-1208型。

TIO-540-E1A Similar to -C1A except rating is increased, different turbocharger control setting and uses Bendix S6LN-1227 magneto instead of S6LN-1208 magneto.

TIO-540-K1AD 与-E1A型相似,但是提高了压缩比,采用双磁电机,压力控制器,提供驾驶舱引气,涡轮增压器安装在发动机的后部。

TIO-540-K1AD Similar to -E1A except increased compression ratio, dual magneto, pressure controller, provision for cabin bleed air has the turbocharger mounted to the rear of the engine.

TIO-540-AB1AD 与-K1AD相似,但是调整了涡轮增压器和密度差调节器,同时双轴磁发电机用动力耦合器代替阻尼制动器。

TIO-540-AB1AD Similar to the -K1AD except for the relocation of the turbocharger and has a density differential controller. Also, the dual magneto is equipped with an impulse coupling instead of retard breaker.

TIO-540-AA1AD 与-AB1AD相似,但是在发动机后部安装了螺旋桨调节器,使用-K1AD涡轮增压器并且无驾驶舱引气。

TIO-540-AA1AD Similar to the model -AB1AD except for a rear mounted prop governor drive, uses the -K1AD turbocharger mounting and has no provisions for cabin bleed.

注 8. 在这些发动机上被认可的起动机,发电机和交流发电机被列在上一版本的德事隆·莱康明公司服务说明书 No. 1154 上。

**NOTE 8. Starter, generators, and alternators approved for use on these engines are listed in the latest revision of Textron Lycoming Service Instruction No. 1154.**