

型号认可证数据单
THE VALIDATION DATA SHEET

编号/No.: VTC0041E

版次/Revision: 1

型号/Type:

TPE331-12UAN

TPE331-12UHR

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职务/Title: Director General of CAAC-AAD

日期/Date: 2018年5月25日

本数据单是型号认可证（编号：VTC0041E）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 part of Validation of Type Certificate (No: VTC0041E), prescribes condition and limitation 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:

Honeywell International Inc.

111 South 34th Street

Phoenix, AZ 85034

有效页清单/List of Effective Page

页数/Pages	1	2	3	4	5	6	7	8	9	10	11		
版次/Revision	1	1	1	1	1	1	1	1	1	1	1		

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 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 Type Certificate Data Sheet Number, Revision and issuance date
当前 Current	VTC0041E, 版次1, 2018年5月25日; VTC0041E, Revision 1, May 25, 2018	FAA TCDS No. E4WE, 第34版, 2014年5月22日 FAA TCDS No. E4WE, Revision 34, May 22, 2014
历史 History	VTC041E, 版次0, 1995年10月23日; VTC041E, Revision 0, October 23, 1995	FAA TCDS No. E4WE, 第23版, 1993年1月7日 FAA TCDS No. E4WE, Revision 23, January 7, 1993

2. 类别/Category: 航空发动机/Aeroengine
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: Honeywell International Inc.
111 South 34th Street
Phoenix, AZ 85034
5. ETOPS: 不适用/NA
6. CAAC专用要求/Special Requirements: 满足中国3号燃油 (GB6537-2006) 的要求。
Compliance with requirement of P.R.China JET
Fuel No.3 (GB6537-2006).

第2部分 数据单

Section 2 DATA SHEET

类型/TYPE

单轴发动机，2级离心压气机，3级轴流涡轮和单环形燃烧室。

Single-shaft engine with two-stage centrifugal compressor, three-stage axial turbine, and singular annular combustion chamber

额定值/Ratings (见注3、4和5/see NOTES 3, 4, and 5)

Model TPE331	最大连续/Maximum Continuous			起飞（5分钟）/Takeoff (5 Minutes)				
	轴马力 SHP	等效轴马力 ESHP	输出轴转速 Output Shaft RPM	轴马力 SHP (干/Dry)	轴马力 SHP (湿/Wet) *	等效轴马力 SHP (干/Dry)	等效轴马力 SHP (湿/Wet) *	输出轴转速 Output Shaft RPM
-12UHR	1050	1100	1591	1100	1100	1151	1156	1591
-12UAN	"	"	"	"	"	"	"	"

*根据注5增加了水-乙醇/Augmented with water-alcohol per NOTE 5

Model TPE331	重量（干）磅/Weight, Dry **(Pounds)	螺旋桨轴到发动机转子的传动比/Propeller-Shaft to engine rotor ratio
-12UHR	405	1:26.229
-12UAN	433	1:26.229

** 这里说的发动机重量由发动机零件清单上的硬件构成，包括进气锥组件、中级机匣和齿轮箱组件、扭矩传感器组件、动力单元（压气机和涡轮）、燃油配送系统（包括低压和高压泵以及带有过滤和防冰功能的旁通和恒温控制阀的燃油滤清器，燃油控制单元，燃油关断阀）、点火系统和螺旋桨滑油管。但不包括：(a) 发动机设备清单上的硬件（燃油控制单元除外），或(b) 发动机零部件清单上编号为“A”或“N”的项目。

The engine weight shown herein consists of hardware as shown on the engine parts list including nose cone assembly, intermediate housing and gear assembly, torque sensor assembly, power group (compressor and turbine), fuel delivery system (including low and high pressure pumps and fuel filter with integral bypass and thermostatically controlled valve for filter and anti-icing, fuel control unit, fuel-shutoff valve), ignition system, and propeller oil flow tube, but does not include: (a) hardware shown on the engine equipment list with the exception of fuel control unit, or (b) items coded “A” or “N” on the engine parts list.

燃油类型和添加剂/FUEL TYPES AND ADDITIVES

参见FAA批准的安插手册（IM-5117）相关章节/Refer to the FAA approved Section of the Installation Manual (IM-5117).

控制/Controls (见注13/See Note 13)

基本发动机的主要尺寸/Principal dimension of basic engine

请参考每个具体的发动机型别构型的安装图，以确定尺寸和重心位置。

Refer to the Installation Drawing for each specific engine model configuration for dimensions and center of gravity location.

滑油/Oil

符合Honeywell International Inc公司规范EMS53110（I型和II型）的滑油获得批准。

Oil conforming to Honeywell International Inc. Specification EMS53110 (Type I and Type II) is approved.

审定基础/Certification Basis

1965年2月1日生效的14 CFR 33部，修正案33-1、33-2和33-3。

14 CFR part 33 dated February 1, 1965 and Amendments 33-1, 33-2, and 33-3.

型号合格证E4WE于1969年3月28日颁发/Type Certificate No. E4WE issued March 28, 1969;

Model TPE331-12UHR于1993年1月7日加入/added January 7, 1993;

Model TPE331-12UAN于2014年5月9日加入/ added May 9, 2014

生产基础/Production Basis

生产合格证No. 413于1965年3月4日颁发，在2000年1月25日重新颁发生产合格证No. 413NM。

Production Certificate No. 413 issued March 4, 1965. Reissued Production Certificate No. 413NM to Honeywell International Inc. on January 25, 2000

注1/NOTE 1: 最大许用温度/Maximum Permissible Temperatures - F(°C)

Model TPE331	排气温度 Exhaust Gas Temperature			涡轮级间温度 Interstage Turbine Temperature			
	最大连续 Maximum Continuous	起飞 Takeoff (5分钟) (干) (5 min.) (Dry)	起飞 Takeoff (5分钟) (湿) (5 min.) (Wet)*	最大连续 Maximum Continuous	起飞 Takeoff (5分钟) (干) (5 min.) (Dry)	起飞 Takeoff (5分钟) (湿) (5 min.) (Wet)	见下面的注释 See Note Below
-12UAN	1202(650)	1202(650)	1202(650)	N/A	N/A	N/A	20
-12UHR	"	"	"	"	"	"	"

*根据注5增加了水-乙醇/Augmented with water-alcohol per NOTE 5

对于配备了涡轮级间温度（ITT）测量系统的发动机，最高许用温度不会随环境或运行条件而变化。

For engines equipped with Interstage Turbine Temperature (ITT) measurement systems the maximum permissible temperatures do not vary with ambient or operating conditions.

对于配备了排气温度（EGT）测量系统但是不使用单红线计算机或发动机电子控制（EEC）进行操作的发动机，最高许用温度是环境温度、高度和其他运行条件的函数。起飞和最大连续EGT为国际标准大气（ISA）海平面静止非安装状态。

其他条件参见IM-5117。发动机转速在65%到79%之间，TPE331-3到-6系列发动机的最高EGT为760℃，TPE331-8到-12系列发动机的最高EGT为770℃。

For engines with Exhaust Gas Temperature (EGT) measurement systems, and not operating with a Single Red-Line (SRL) computer or Electronic Engine Control (EEC), the maximum permissible temperatures vary as a function of ambient temperature, altitude, and other operating conditions. Takeoff and maximum continuous EGT temperatures are for International Standard Atmosphere (ISA) sea-level, static un-installed conditions. Consult IM-5117 for other conditions. The maximum EGT for operation between 65 percent and 79 percent engine speed is 760°C for the TPE331-3 through -6 series engines and is 770°C for the TPE331-8 through -12 series engines.

对于配备了EGT测量系统，并且使用单红线计算机或EEC进行操作的发动机，最高许用温度不随发动机转速外的其他条件变化。对于TPE331-8至-12系列发动机，发动机转速在65%至79%之间，最高EGT为770℃。发动机转速高于80%，TPE331-8系列和-10N发动机的最高指示EGT为450℃，TPE331-12B型号发动机和装配有单红线计算机的发动机的最大指示EGT为650℃。自动功率储备系统（APR）/受限功率储备系统（RPR）激活除外。（见注20）。

For engines equipped with EGT measurement systems, and operating with a SRL computer or EEC, the maximum permissible temperature does not vary under any condition except engine speed. The maximum EGT for operation between 65 percent and 79 percent engine speed is 770 °C for the TPE331-8 through -12 series engines. For engine speeds above 80 percent the maximum indicated EGT is 450 °C for TPE331-8 series, and -10N model engines, or 650 °C for TPE331-12B model engine and engines equipped with a SRL computer, except when APR/RPR is activated. (See NOTE 20).

Model TPE331	起动过程中最高EGT（1秒限制） Maximum Exhaust Gas Temperature During Starting (1 sec. Limit): °F (°C)	起动过程中最高级间温度（1秒限制） Maximum Interstage Temperature During Starting (1 sec. Limit): °F (°C)
-12UHR, -12UAN	1418 (770)	不适用/N/A

滑油温度和规范/Oil Temperature and Specifications:

霍尼韦尔规范 Honeywell Specification	润滑剂类型等效的军方规范 Type of Lubricant Equivalent Military Specification	最低起动温度 Minimum of Starting °F (°C)
EMS53110 TYPE I	MIL-PRF-7808	-40 (-40)
EMS53110 TYPE II	MIL-PRF-23699	-40 (-40)

注/Note: 滑油压力和温度限制值参见IM-5117 FAA批准的章节，润滑系统。

Refer to IM-5117, FAA Approved Section, Lubrication System, for oil pressure and temperature limits.

外界大气温度/Ambient Air Temperature, °F (°C)

	起动/Starting	运行/Operation
最低/Minimum	-40 (-40)**	--
最高/Maximum	130 (55)	130 (55)

** 只要发动机滑油温度和电气部件稳态温度不低于-40°F (-40°C)，外界大气温度低于-40°F (-40°C)起动时可接受的。

Starting in ambient air temperatures below -40 °F (-40 °C) is acceptable provided the engine oil and electrical components' steady state temperatures are not less than -40 °F (-40 °C).

发动机外部部件表面温度限制值（参见安装手册IM-5117，A部分）。

Engine External Components Surface Temperature Limits (See Installation Manual IM-5117, Section A).

注2/NOTE 2: 压力限制/Pressure Limits

燃油泵进口压力, 最低正常运行值, 运行限制参考IM-5117 Fuel pump inlet pressure, minimum normal operation, refer to IM-5117 for operational limitations	5 psig加上燃油的真实蒸汽压 5 psig plus true vapor pressure of fuel
与发动机接口处最低滑油压力 Minimum oil pressure at inlet connection to the engine	2.45 psig
地面慢车滑油工作压力 (在65%转速的最小值) Oil operating pressure ground idle (minimum at 65% speed)	40 psig
滑油压力正常范围/Normal operating range	70至/to 120 psig
滑油压力正常范围 (高于23,000英尺) Normal operating range (above 23,000 ft. altitude)	50至/to 120 psig
最小的水乙醇歧管入口压力 Minimum water-alcohol augmentation manifold inlet pressure	(见注5/see NOTE 5)

注3/NOTE 3: 发动机额定值基于/The Engine Ratings are based on:

功率计是在国际标准大气 (ISA)、海平面静态条件下工作, 见注1.

Dynamometer operation at International Standard Atmosphere (ISA), Sea Level Static Conditions, see NOTE 1.

MIL-DTL-5624, 燃油等级JP-4, 每磅低热值18,400 BTU。

MIL-DTL-5624, Grade JP-4 fuel with lower heating value of 18,400 BTU per pound.

MIL-PRF-23699滑油, 美孚滑油Jet II, 或者Exxon 2380。

MIL-PRF-23699 type oil, Mobil Oil Jet II, or Exxon 2380.

无引气提取/No bleed-air extraction.

无防冰气流/No anti-icing airflow.

无外部附件载荷/No external accessory loads.

零进口损失/Zero inlet loss.

通过安装在发动机上的涡轮出口扩压器将尾气排放至静态环境中

Exhaust gas discharging to ambient-static pressure through the turbine exhaust diffuser furnished with the engine.

涡轮气体温度 (ITT或EGT) 不超限/Turbine gas temperature (ITT or EGT) limits not exceeded.

注4/NOTE 4: 静态等效轴马力 (ESHP) 是基于/Equivalent Shaft Horsepower (ESHP) for Static Conditions is based on:

$$ESHP = \frac{\text{净推力/Net thrust, 磅/pounds}}{2.5} + SHP$$

注5/NOTE 5: 增强性能/Augmented Performance

A. 增强的发动机额定值在第3页列出/Augmented engine ratings are listed on Page 3.

B. 增强的涡轮级间温度或排气温度限制值见注1。

Augmented interstage turbine temperature or exhaust gas temperature limits are stated in NOTE 1.

C. 注7中的发动机螺旋桨轴扭矩限制值应保持不变

Engine propeller shaft torque limits per NOTE 7 shall remain the same.

D. 水-乙醇混合物必须符合FAA批准的安装手册IM-5117

Water-alcohol mixture must conform to that shown in FAA approved Installation Manual IM-5117.

E. 最低的水-乙醇流量基于发动机的功率要求, 并通过飞机制造商和霍尼韦尔国际公司协商确定。

Minimum water-alcohol flow rate is dependent on engine power requirements and is determined through coordination of the aircraft manufacturer and Honeywell International Inc.

F. 要求的水-乙醇总管压力获得的特定流量被刻在每个总管上。

Water-alcohol manifold pressure required to obtain specified flow is stamped on each manifold.

Engine Model	水-乙醇流量, 磅/小时 (注5D) Water-Alcohol Flow Rate – lb/hr (NOTE 5D)		水-乙醇总管压力 (psig) (见注5F) Water Alcohol Manifold Pressure (psig) (NOTE 5F)
	最小/Minimum	最大/Maximum	
-12UHR	注5E/NOTE 5E	1300	N/A
-12UAN	注5E/NOTE 5E	1300	N/A

注6/NOTE 6: 附件规定/Accessory ProvisionsA. 飞机附件/Aircraft Accessory

驱动类型/Type of drive: (各1个/one each)	AND20001 Type X1-B (修订版/Modified)
AND驱动更改/AND drive modifications	旋转方向和转速/Rotation and RPM
转动方向 (面向驱动安装座) Rotation facing drive pad	逆时针/CCW
100%发动机转速下的每分钟转速 RPM at 100 percent engine speed	3959
最大扭矩 (英寸磅)/Maximum torque (lb-in.) Tc, 连续扭矩/continuous torque	250
To, 扭矩过载/torque overload	375
Ts静态扭矩/static torque	1650
悬臂力矩 (英寸磅) /Overhung moment (lb-in.)	125
传动比, 驱动到发动机转子 Speed ratio, drive to engine rotor	0.09487

B. 起动机、起动-发电机或交流发电机/Starter, Starter-generator or Alternator

驱动类型/Type of drive: (各1个/one each)	AND20002 Type XII-D (修订版/Modified)
AND驱动更改/AND drive modifications	转速、连续扭矩、扭矩过载和旋转30度的螺栓形

	式/RPM, Tc, To and stud pattern rotated 30 degrees
转动方向（面向驱动安装座） Rotation facing drive pad	顺时针/CW
100%发动机转速下的每分钟转速 RPM at 100 percent engine speed	12,175
最大扭矩（英寸磅）/Maximum torque (lb-in.) Tc, 连续扭矩/continuous torque	300
To, 扭矩过载/torque overload	600
Ts静态扭矩/static torque	2,200
悬臂力矩（英寸磅）/Overhung moment (lb-in.)	500
传动比，驱动到发动机转子 Speed ratio, drive to engine rotor	0.29175

C. 测速发电机/Tachometer Generator

驱动类型/Type of drive: （各1个/one each）	AND20005 Type XV-B（修订版/Modified）
AND驱动更改/AND drive modifications	更短的螺栓和螺纹长度 Shorter studs and thread lengths
转动方向（面向驱动安装座） Rotation facing drive pad	顺时针/cw
100%发动机转速下的每分钟转速 RPM at 100 percent engine speed	4,187
最大扭矩（英寸磅）/Maximum torque (lb-in.) Tc, 连续扭矩/continuous torque	7
Ts静态扭矩/static torque	50
悬臂力矩（英寸磅）/Overhung moment (lb-in.)	25
传动比，驱动到发动机转子 Speed ratio, drive to engine rotor	0.10033

D. 螺旋桨调速器/Propeller Governor

驱动类型/Type of drive: （各1个/one each）	AND20010 Type XX-A（修订版/Modified）
AND驱动更改/AND drive modifications	RPM
转动方向（面向驱动安装座） Rotation facing drive pad	顺时针/CW
100%发动机转速下的每分钟转速 RPM at 100 percent engine speed	3,754
最大扭矩（英寸磅）/Maximum torque (lb-in.) Tc, 连续扭矩/continuous torque	125
To, 扭矩过载/torque overload	188
Ts静态扭矩/static torque	N/A

悬臂力矩（英寸磅）/Overhung moment (lb-in.)	125
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E. 螺旋桨桨距控制/Propeller Pitch Control

驱动类型/Type of drive: （各1个/one each）	安装座/Mounting pad provided
悬臂力矩（英寸磅）/Overhung moment (lb-in.)	30

注7/NOTE 7: 扭矩传感器检测到的最大许用螺旋桨轴扭矩，以英尺磅为单位

Maximum Allowable Propeller Shaft Torque as Sensed by the Torque Sensor, in Pound Feet

型别/Model TPE331	5分钟扭矩限制值/5 Minute Torque Limit	最大连续/Maximum Continuous
-12UHR, -12UAN	3631	3466

注8/NOTE 8: 螺旋桨输出轴（螺栓连接法兰盘）最大速度、百分比（RPM）和转向

Propeller Output Shaft (Bolted Flange) Maximum Speed, Percent (RPM) and Direction of Rotation

型别/Model TPE331	-12UHR, -12UAN
正常运行/Normal Operation	100.0 (1591)
持续运行/Continuous Operation	101.0 (1607)
瞬态极限/Transient Limit	104.0 (1655) 注22/NOTE 22
旋转方向，从尾部向前看/Rotation, aft looking forward	逆时针/CCW

注9/NOTE 9: 合并到注8/Incorporated into NOTE 8.

注10/NOTE 10: 最多10%的发动机气流可用于引气（起动过程中除外）。在这10%的总量中，1.2%被发动机上安装的防冰系统所用

Up to 10 percent of the engine airflow is available for bleed air purposes (except during starting). Of this 10 percent total, 1.2 percent is utilized by the engine mounted anti-icing system.

注11/NOTE 11: 这些发动机满足美国联邦航空局关于涡轮盘的完整性和转子叶片包容的要求，无需要外部保护罩。

These engines meet FAA requirements for adequate turbine disk integrity and rotor blade containment, and do not require external armoring.

注12/NOTE 12: 这些发动机满足美国联邦航空局14 CFR 25部附录C最初版中所定义的结冰条件下运行的要求。

These engines meet FAA requirements for operation in icing conditions within the envelope defined in 14 CFR part 25 Appendix C, original issue.

注13/NOTE 13: 发动机构型和安装部件的变化，通过在发动机铭牌上基本型号增加后缀标识来实现，例如TPE331-3-XY（“X”表示霍尼韦尔安装构型等级代码号，“Y”表示飞机制造商或补充型号合格证书持有者的霍尼韦尔设备代码字母），以及通过发动机件号来实现。发动机铭牌上的发动机件号，标识了在发动机取证过程中已证明与发动机本体相兼容的特定零件清单及设备列表。然而，这些特定零件及设备在特定航空器上的操作、功能和装配必须在航空器取证期间进行验证。与这些因素相关的后续设计更改控制是航空器制造商的责任。

Variations in engine configuration and installation components are identified on the engine nameplate by a

suffix to the basic model number; i.e., TPE331-3-XY (“X” denotes Honeywell installed configuration rating code number(s) and “Y” denotes Honeywell equipment code letter(s) of aircraft manufacturer or supplemental type certificate holder), and by an engine part number. The engine part number shown on the engine nameplate identifies the specific parts list and/or equipment list which have been demonstrated as compatible with the basic engine during engine certification; however, the operation, functioning, and rigging of these in a specific aircraft must be demonstrated during aircraft certification. Subsequent design change control associated with these factors is the responsibility of the aircraft manufacturer.

注14/NOTE 14: 保留/Reserved

注15/NOTE 15: 某些发动机零件是寿命件，其寿命在以下经FAA批准的Honeywell服务通告中列出：
Certain engine parts are life limited. These limits are listed in the FAA-Approved Honeywell International Inc. Service Bulletins as follows:

发动机系列/Engine Series	Honeywell服务通告/Honeywell Service Bulletins
TPE331-12	TPE331-72-0476 修订版32，或后续经FAA批准的版本。 TPE331-72-0476 Revision 32, or later FAA approved revisions

注16/NOTE 16: 在航空器合适的标牌或FAA批准的飞行手册中应酌情包含以下信息：“避免在18%至28%的转速区间内运行，除非是启动和关停发动机的过渡状态。”

The following information should be included, as appropriate, in a suitable aircraft placard or FAA approved flight manual - "Avoid operation between 18 and 28 percent rpm, except for transient occurring during start and shut-down."

注17/NOTE 17: 保留/Reserved

注18/NOTE 18: 在第26修订版中删除/Deleted with Revision 26.

注19/NOTE 19: 在第25修订版中删除/Deleted with Revision 25.

注20/NOTE 20: 某些TPE331-12系列发动机功率管理系统可能包含一个单红线（SRL）温度指示系统和一个自动扭矩和温度限制系统。在单红线（SRL）限制值1202 ℉（650 ℃）时，这些发动机将提供最小额定热力学性能。TPE331-12UHR和-12UAN发动机具有自动功率储备系统（APR）或限制功率储备系统（RPR）的能力，在多引擎飞机中，如果一台发动机发生显著的功率损失，这种能力则将对另外的发动机增加功率。当APR/RPR EGT补偿器未通电并且APR/RPR在温度限制被禁用的情况下被激活时，-12UHR和-12UAN型号发动机经批准可以在直至675 ℃的单红线（SRL）值运行。当APR/RPR被激活时，飞机会启用EGT补偿，以减少指示EGT，防止超过EGT限制设定值（650 ℃或660 ℃，取决于安装情况）。

Certain TPE331 -12 series engine power management systems may include a SRL temperature indicating system and an automatic torque and temperature limiting system. At the SRL limit value of 1202 ℉ (650 ℃), these engines will provide a minimum of rated thermodynamic performance. The TPE331-12UHR, and -12UAN engines have the capability of Automatic Performance Reserve (APR) or Restricted Power Reserve (RPR) to provide a thermodynamic power increase in some multi-engine aircraft installations if significant power loss occurs on another engine. The engines are approved for operation up to an SRL value of 675 ℃ for -12UHR, and -12UAN when the APR/RPR EGT compensator is not powered and APR/RPR is activated with temperature limiting disabled. The aircraft may incorporate EGT compensation that will reduce the indicated

EGT to preclude exceeding the EGT limiting set point (650 °C or 660 °C depending on the installation), when APR/RPR is activated.

在SRL计算机不工作的情况下，TPE331-12UHR和-12UAN发动机在ISA/海平面条件下的EGT限制值为1116 °F（602 °C），该值是环境条件的函数随之变化。非标准日EGT限制值参见IM-5117。

With the SRL computer inoperative, the EGT limit for the TPE331-12UHR, and -12UAN engines is 1116 °F (602 °C) at ISA/sea level and will vary as a function of ambient conditions. Consult IM-5117 for off-standard day EGT limits.

航空器安装部件的接口和安装要求在IM-5117中还规定。

Component interface and installation requirements of the aircraft-installed components are also prescribed in IM-5117.

注21/NOTE 21: 在第26修订版中删除/Deleted with Revision 26.

注22/NOTE 22: 在螺旋桨处于起动锁定时，进行燃油控制超速调速器测试允许螺旋桨输出轴转速瞬时超过104%，最大106%。该测试的程序和限制参见发动机维修手册。

Transient operation of propeller output shaft speed above 104 percent, to a maximum of 106 percent is allowable for fuel control overspeed governor test when the propeller is on the start locks (not applicable to TSE331-3U). Refer to engine maintenance manual for proper procedures and limitations for this test.

--结束--

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