

型号认可证数据单
THE VALIDATION DATA SHEET

编号/No.: VTC0271E

版次/Revision: 0

型号/Type:

GENx-1B54

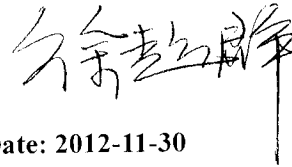
GENx-1B58

GENx-1B64

GENx-1B67

GENx-1B70

批准人/Approved by:



日期/Date: 2012-11-30

本数据单是型号认可证（编号 VTC0271E）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: VTC0271E), 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:

General Electric Company
GE Aviation
1 Neumann Way
Cincinnati, OH, US 45215-6310

有效页清单/List of effective pages :

页数/ Pages	1	2	3	4	5	6	7	8	9	10	11	12	13	14
版次/Revision	0	0	0	0	0	0	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	No. VTC0109E, 版次 0, 2012 年 11 月 30 日 No. VTC0109E, Revision 0, Nov. 30th, 2012	FAA TCDS No. E00078NE, Revision 6, March. 2, 2012
历史 History	无	None

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: General Electric Company
GE Aviation
1 Neumann Way
Cincinnati, OH, US 45215-6310
6. ETOPS: 330 分钟 ETOPS 资格 /330minutes ETOPS eligibility
7. 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

SECTION 2

I. 型号/MODELS	GENx-1B54	GENx-1B58	GENx-1B64	GENx-1B67	GENx-1B70
类型/TYPE 额定值 (见注 5) RATINGS (See NOTE 5) 最大连续, 海平面, Maximum continuous, at sea level, 静态推力, 磅/ static thrust, lb 风扇转速, 转每分钟/ fan speed, rpm 起飞 (5 分钟, 见注 12), 海平面, Takeoff (5 min. see NOTE 12), at sea level, 静态推力, 磅/ static thrust, lb 风扇转速, 转每分钟/ fan speed, rpm 平台额定环境温度值/Flat rating ambient temperature 起飞/Takeoff 最大连续/Maximum continuous	GENx-1B 系列发动机是双转子、轴流、高涵道比涡轮风扇发动机。该发动机的 10 级高压压气机由 2 级高压涡轮驱动顺时针转向 (从后向前看); 1 级风扇和 4 级低压压气机由 7 级低压涡轮驱动逆时针转向; 发动机控制系统包含与航空器进行数字通信的 FADEC; EMU 为航空器提供发动机振动状态数据。 The GENx-1B engine is a dual rotor, axial flow, high bypass ratio turbofan. The 10-stage high pressure compressor is driven clockwise (Aft Looking Forward) by a 2-stage high pressure turbine. The single stage fan and 4-stage low pressure compressor are driven counterclockwise (Aft Looking Forward) by a 7-stage low pressure turbine. The engine control system includes a Full Authority Digital Engine Control (FADEC), which has an aircraft connection for digital communication. An engine monitoring unit (EMU) provides vibration level signals to the aircraft.				
	56,300	--	61,500	--	66,500
	2,166	--	2,247	--	2,319
	57,400	61,000	67,000	69,400	72,300
	2,184	2,239	2,326	2,360	2,401
	86°F/30°C	--	--	--	--
	77°F/25°C	--	--	--	--
注: 1. ‘--’ 表示相同; 2. ‘-’ 表示不适用。					

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I. 型号/MODELS	GENx-1B54	GENx-1B58	GENx-1B64	GENx-1B67	GENx-1B70
型号清单	GENx1B54G01 GENx1B54G02 GENx1B54G03 GENx1B54G04 GENx1B54G05	GENx1B58G01 GENx1B58G02 GENx1B58G03 GENx1B58G04 GENx1B58G05	GENx1B60G01 GENx1B60G02 GENx1B60G03 GENx1B60G04 GENx1B60G05	GENx1B67G01 GENx1B67G02 GENx1B67G03 GENx1B67G04 GENx1B67G05	GENx1B70G01 GENx1B70G02 GENx1B70G03 GENx1B70G04 GENx1B70G05
组件 (GE P/Ns)					
燃油计量装置 Fuel Metering Unit	2122M20	--	--	--	--
FADEC 硬件 FADEC Hardware	2121M82 2447M85	-- --	-- --	-- --	-- --
FADEC 软件 FADEC Software	2124M23P13 (G03-G05 Model List)	--	--	--	--
构型外盒发动机构型 Configuration Box Engine Configuration	2400M60P03 (G03 Model List) 2400M60P06 (G04/G05 Model List)	-- --	-- --	-- --	-- --
FADEC额定值销 FADEC Rating Plug	2125M31P62	2125M31P08	2125M31P68	2125M31P20	2125M31P74
燃油泵 Fuel Pump	2122M22	--	--	--	--
点火系统/ IGNITION SYSTEM					
两个点火激励器GE P/N Two igniter exciters GE P/N	2121M94	--	--	--	--
两个点火塞GE P/N Two igniter plugs GE P/N	1754M84	--	--	--	--

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I. 型号/MODELS	GE _{nx} -1B54	GE _{nx} -1B58	GE _{nx} -1B64	GE _{nx} -1B67	GE _{nx} -1B70
主要尺寸 PRINCIPAL DIMENSIONS (in)					
长度（风扇机匣前法兰到低 压涡轮后法兰）/ Length (fan case forward flange to LPT frame aft flange)	194.9	--	--	--	--
宽度（最大外壳）/ Width (maximum envelope)	139.1	--	--	--	--
高度（风扇机匣前法兰外径） /Height (fan case forward flange outer diameter)	137.2	--	--	--	--
重量（干重） WEIGHT (dry)	13,505 磅 (G01-G03 Model List)	--	--	--	--
包括发动机本体，基本发动 机附件和在发动机制造商规 范中列出的选装设备 Includes basic engine, basic engine accessories, and optional equipment as listed in the manufacturer's engine specifications.	13,552 磅 (G04/G05 Model List)	--	--	--	--
重心位置（英寸），仅发动机 CENTER OF GRAVITY LOCATIONS (in): Engine only					
站位（轴向） Station (axial)	216.1 英寸 (G01-G03 Model List)	--	--	--	--
	216.6 英寸 (G04/G05 Model List)	--	--	--	--
水平线 Waterline	99.9 英寸	--	--	--	--
纵剖线 Buttline	100.7 英寸	--	--	--	--

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I. 型号/MODELS	所有/All
燃油/FUEL 滑油/OIL	见注释 7 已批准的燃油。 2 类滑油的相关信息参见最新修订的 GENx-1B 服务通告 SB79-001。该服务通告包含了批准的符合 GE 规范 D50TF1 或最新修订版本的滑油。 See NOTE 7 for approved fuels. Refer to GENx-1B Service Bulletin 79-0001 and GENx-2B Service Bulletin 79-0001 and its latest revision for detailed information pertaining to Type 2 oils. These Service Bulletins cover the approved oils conforming to General Electric Specification D50TF1 or the latest revisions that are authorized.

审定基础/

CERTIFICATION BASIS

GENx-1B54, -1B58, -1B64, -1B67,
和 -1B70
GENx-1B54, -1B58, -1B64, -1B67,
and -1B70

- 1965 年 2 月 1 日生效的 14 CFR 第 33 部, 第 1 到 21 修正案并包括 23 修正案的 33.76。 / 14 CFR Part 33, effective February 1, 1965, as amended by 33-1 through 33-21 and amendment 33-23 section 33.76.
- 燃油排放和排气污染标准, 1990 年 9 月 10 日生效的 14 CFR 第 34 部, 第 1 到第 4 修正案。 / Fuel Venting and Exhaust Emissions Standards, 14 CFR Part 34, effective September 10, 1990, as amended by 34-1 through 34-4.
- GENx-1B 风扇叶片专用条件(33-006-SC) / GENx-1B Fan Blade Special Condition (33-006-SC)
- 等效安全判定: / Equivalent Level of Safety (ELOS) Findings:
 - ELOS No. 8040-ELOS-08-NE02, 14 CFR §33.87(a) & (b)等效安全
ELOS No. 8040-ELOS-08-NE02 to 14 CFR §33.87(a) & (b)
- 适用于高压涡轮一级叶片件号为 2305M26P03 和/或燃烧室燃油喷嘴件号为 2255M88P09, 2255M88P10, 和 2256M66P10 的发动机 / Applicable to engines with high pressure turbine stage 1 blade part number 2305M26P03 and/or combustor fuel nozzle part numbers 2255M88P09, 2255M88P10, and 2256M66P10
 - ELOS No. 8040-ELOS-08-NE03, 14 CFR §33.27(c)等效安全
ELOS No. 8040-ELOS-08-NE03 to 14 CFR §33.27(c)
 - ELOS No. 8040-ELOS-08-NE04, 14 CFR §33.90 等效安全
ELOS No. 8040-ELOS-08-NE04 to 14 CFR §33.90
- 适用于燃烧室件号为 2257M40G03/G04 的发动机 / Applicable to engines with combustor chamber part numbers 2257M40G03/G04
 - ELOS No. 8040-ELOS-08-NE05, 14 CFR §33.77 等效安全
ELOS No. 8040-ELOS-08-NE05 to 14 CFR §33.77
 - ELOS No. 8040-ELOS-10-NE03, 14 CFR §33.68(a)等效安全
ELOS No. 8040-ELOS-10-NE03 to 14 CFR §33.68(a)

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型号/ MODEL	申请日期/APPLICATION DATE	TC 颁发/修订 TYPE CERTIFICATE ISSUED/AMENDED
GEnx-1B54	Dec. 13, 2004	March.31.2008
GEnx-1B58	May.24.2005	March.31.2008
GEnx-1B64	Dec.13.2004	March.31.2008
GEnx-1B67	May.24.2005	March.31.2008
GEnx-1B70	Dec.13.2004	March.31.2008

CAAC 认可审定基础/ CAAC VALIDATION BASIS 接受 FAA 的审定基础作为认可审定基础。
Accept FAA certification basis as validation basis.

生产基础/ PRODUCTION BASIS 生产合格证 No. 108。
Production Certificate No. 108

注释/ NOTE

注 1/NOTE 1 最大许用发动机转子转速 /MAXIMUM PERMISSIBLE ENGINE ROTOR SPEEDS

低压转子/Low pressure rotor (N1): 2,726 RPM
高压转子/High pressure rotor (N2) : 13,425 RPM

注/NOTES:

A) 百分之一的 N1 转速是/100 percent N1 is: 2,560 RPM
B) 百分之一的 N2 转速是/100 percent N2 is: 11,377 RPM

注 2/NOTE 2 最大许用温度（所有型号）/MAXIMUM PERMISSIBLE TEMPERATURES (ALL MODELS)

指示的涡轮排气温度（T495）（见注 5）

Indicated turbine exhaust gas temperature (T49) (See NOTE 5)

起飞 5 分钟（见注 12）/ 1,895°F (1,035°C)
Takeoff 5 minutes (see NOTE 12)

30 秒最大瞬时/ 1,904°F (1,040°C)
30 seconds Maximum Transient

最大连续 1,841°F (1,005°C)
Maximum Continuous

地面起动（手动或自动）/ 1,382°F (750°C)
Ground starts (manual or auto)

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空中起动 (手动或自动) / 1,607°F (875°C)
Inflight starts (manual or auto)

空中起动 (高功率断油和快速风车起动) / 1,787°F (975°C)
Inflight starts (high power fuel cut and
quick windmill re-light)

滑油温度限制/Oil temperature limits
连续/Continuous 320°F (160°C)
瞬时/Transient (15 minutes) 350°F (177°C)

注 3/NOTE 3 燃油和滑油压力限制/FUEL AND OIL PRESSURE LIMITS

发动机燃油泵进口处燃油压力限制/FUEL PRESSURE LIMITS AT THE ENGINE PUMP INLET

从最低燃油压力(不低于真实蒸汽压力+5.0psi 和环境+5.0psi 中较大者)至最大 70 psig。
The limit is from minimum fuel pressures of not less than the greater of true vapor pressure plus 5.0 psi or ambient plus 5.0 psi to a maximum of 70 psig.

对于安装于 B787 飞机上的 GENx-1B 发动机, 最低燃油压力限制延伸至最大 60 分钟最低燃油压力 3.5 psia 和最大气液比 (v/l) 0.45, 以及最大 600 分钟最小燃油压力 3.5 psia 和最大气液比 (v/l) 0.28.

For the GENx-1B, on the 787 aircraft, the minimum fuel pressure limit is extended down to minimum fuel pressure of 3.5 psia and maximum vapor-to-liquid ratio (v/l) of 0.45 for up to 60 minutes followed by up to 600 minutes with minimum fuel pressure of 3.5 psia and a maximum vapor-to-liquid ratio (v/l) of 0.28.

滑油压力限制/OIL PRESSURE LIMITS

最低和最高滑油压力见 GENx-1B 使用说明书 GEK 112857 图 8-1.

See Figure 8-1 of GENx-1B Operating Instructions GEK 112857 for definition of minimum and maximum oil pressures.

注 4/NOTE 4 GENx 附件驱动特性
GENx ACCESSORY DRIVE CHARACTERISTICS

附件 Accessory	定义 Defined By	转向 (注释 5) Rotation (See Comment A)	齿轮/核心转 子比 Gear Ratio to Core Rotor	驱动轴 (转/ 分钟) Drive Shaft (RPM)	最大重量 磅 (公斤) Maximum Weight LB (KG)	最大悬臂力 矩 英寸-磅 (牛·米) Maximum Overhung Moment	剪切力矩 英寸-磅 (牛·米) Shear Torque IN-LB (N·m)	连续额定值 马力 (空中- 共两个 VFSG) Continuous Pad Rating HP (Inflight)	过载 (马力) Overload (HP)
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						IN-LB (N-m)		-total for both VFSG's)	
VFSG 1	ICNR-GE -BE059	CCW	1.1331	12,891.30	234.4 (106.3) 湿重/WET	1,718 (194.4)	19,596-20,220 (2,214-2,285)	692 (两台发动机 /Dual Engine) 790 (一台发动机 /Single Engine)	见注释C See Comment C
VFSG 2	ICNR-GE -BE060	CCW	1.1331	12,891.30	234.4 (106.3) 湿重/WET	1,718 (194.4)	19,596-20,220 (2,214-2,285)	692 (两台发动机 /Dual Engine) 790 (一台发动机 /Single Engine)	见注释C See Comment C 85 [5 sec]
液压泵/ Hydraulic Pump	ICNR-GE -BE057	CCW	0.4438	5,049.10	30.3 (13.74) 湿重/WET	140 (15.81) 湿重/WET	2,625-3,715 (297-420)	见注释D See Comment D	
核心转子转 动 Core Turn	0.5 Square Drive/ Dwg- 2305M71	CCW	0.6773	7,705.60	N. A.	N. A.	N. A.	N. A.	N. A.

注释:

A. 转向定义为面向驱动座/Rotation is defined facing the pad.

B. 百分之一的发动机核心转速为11,377转每分钟/100 percent engine core speed is 11,377rpm.

C. 1秒钟1,021马力故障, 每工作小时发生0.001次, 1秒钟910马力, 每工作小时发生2次 (一台发动机)。/1,021 HP fault: for 1 second, occurring 0.001 times per operating hour and 910 HP for 1 second, occurring 2 times per operating hour [single engine].
1秒钟869马力故障, 每工作小时发生4次, 1秒钟821马力, 每工作小时发生2次 (两台发动机)。/869 HP fault for 1 second, occurring 4 times per operating hour and 821 HP for 1 second, occurring 2 times per operating hour [dual engine].

D. 齿轮箱设计为1,150 磅-英寸恒定力矩最大至60马力。/1,150 lbs-inch constant torque to a max of 60 HP for the gearbox design.

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注 5/NOTE 5 发动机额定值 /ENGINE RATINGS

发动机额定值是基于下列条件下的校准台架性能: /Engine ratings are based on calibrated test stand performance under the following conditions:

1. 海平面静止状态, 标准压力(14.696 psia), 59 °F /Sea level static, standard pressure (14.696 psia), 59 °F
2. 无客户端引气和功率提取 /No customer bleed or customer horsepower extraction
3. 理想进气, 100%冲压恢复 /Ideal inlet, 100% ram recovery
4. 生产型飞机飞行整流罩 /Production aircraft flight cowlings
5. 生产型传感设备 /Production instrumentation
6. 燃油低热值 18,400 BTU/lb /Fuel lower heating value of 18,400 BTU/lb

注 6/NOTE 6 最大许用引气提取 /MAXIMUM PERMISSABLE BLEED AIR EXTRACTION

适用于未装有增压防冰系统的发动机 /applicable to engines not equipped with booster anti-ice system

	7级-W25的百分比 /Stage 7 - Percent W25
任何功率设置 /Any Power Setting	3.3%

适用于装有增压防冰系统的发动机 /applicable to engines equipped with a booster anti-ice system

风扇修正转速的百分比 Percent Corrected Fan Speed (N1K)	7级-W25的百分比 Stage 7 - Percent W25
0 to 31.3	5.0%
31.3 to 66.4	4.7%
> 66.4	3.3%

注释 /Comments:

- A. 百分之一百发动机风扇转速为2,560转每分钟 /100% engine fan speed is 2,560 RPM
- B. 任何功率设置下, 发动机进气道防冰系统供气最大流量为3.3% W25 /3.3% W25 is the maximum flow delivered to the engine inlet anti-ice system at any power setting.

注 7/NOTE 7 燃油/FUEL

关于燃油和添加剂的详细信息参见GENx-1B 服务通告73-0001。该服务通告包含符合GE航空规范D50TF2的燃油清单。适用的燃油等级为: /Refer to GENx-1B Service Bulletin 73-0001 for detailed information pertaining to fuels and additives. These Service Bulletins cover the eligible fuels listed per GE Aviation Specification D50TF2. Eligible fuel classifications are:

A类-航空煤油 /Class A – Aviation Kerosene

C类-低凝固点煤油 /Class C – Low Freeze Kerosene

D类-高闪点煤油 /Class D – High Flash Kerosene

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E类-低闪点煤油 /Class E -- Low Flash Kerosene

注：B类-（Jet B, JP4）禁用 /NOTE: Class B – (Jet B, JP4) is prohibited

注 8/NOTE 8

寿命限制 /LIFE LIMITS

GENx-1B54, -1B58, -1B64, -1B67, 和-1B70关键转动件的寿命限制在GENx发动机手册GEK 112851第5章公布。/Life limits for critical rotating components for the GENx-1B54, -1B58, -1B64, -1B67, and -1B70 are published in Chapter 5 of the GENx Engine Manual, GEK 112851.

GENx-1B循环寿命限制基于商业任务循环，包括起动、起飞、爬升、巡航、下降和着陆。着陆过程中使用（或不使用）风扇反推装置来减速都不影响循环计数。下面任何一种都可作为一个循环：/The GENx-1B cyclic life limits are based on a commercial mission cycle, which consists of a start, takeoff, climb, cruise, descent, and landing. Use (or non-use) of a fan reverser for braking during landing does not affect cycle counts. Each of the following constitutes one cycle:

- (1) 一次包括起飞和着陆的飞行， /a flight consisting of a takeoff and landing,
- (2) 一次接地-复飞着陆或者模拟接地-复飞着陆（无轮载）的飞行员培训。 /a touch-and-go landing or simulated touch-and-go landing (no weight on wheels) for pilot training.

注 9/NOTE 9

推力设置参数 /THRUST SETTING PARAMETER

所有运行的功率设置，功率检查和发动机推力输出控制都是基于风扇转速（N1）。为此，转速传感器包括在发动机组件中。

Power setting, power checks, and control of engine thrust output in all operations are based on Fan Speed (N1). Speed sensors are included in the engine assembly for this purpose.

注 10/NOTE 10

结冰条件 /ICING CONDITIONS

GENx-1B54, -1B58, -1B64, -1B67, and -1B70发动机在结冰条件下地面运转的要求、限制和注释都在使用说明手册GEK 112857中详细说明。

For ground operation in icing conditions, requirements, limitations, and notes are specified in GENx-1B54, -1B58, -1B64, -1B67, and -1B70 Operating Instructions Manual GEK 112857 .

注 11/NOTE 11

负加速度运行 /NEGATIVE G OPERATION

仅在“负-G”运行时，允许在最低滑油压力以下工作15秒。GENx-1B54, -1B58, -1B64, -1B67, and -1B70最低滑油压力定义见GENx使用说明手册GEK 112857，第8节。

During "negative-G" operation only, it is permissible to operate below minimum oil pressure for a maximum of 15 seconds. See GENx Operating Instructions, GEK 112857, Section 8, for the GENx-1B54, -1B58, -1B64, -1B67, and -1B70 minimum oil pressure definition.

注 12/NOTE 12

起飞时间限制 /TAKEOFF TIME LIMIT

一台发动机停车的意外情况下正常5分钟起飞额定值可以延长至10分钟。

The normal 5 minute takeoff rating may be extended to 10 minutes for engine out contingency.

注 13/NOTE 13 时间限制派遣准则 /TIME LIMITED DISPATCH CRITERIA

关于发动机控制系统时间限制派遣准则和维护要求在以下文件中规定： /Criteria pertaining to the engine control systems' dispatch and maintenance requirements are specified in:

对于GENx-1B54, -1B58, -1B64, -1B67, and -1B70型号的发动机： GE文件 GEK 112858和GENx发动机手册GEK 112851适航限制章节，定义了各种构型和最大运行间隔。

For the GENx-1B54, -1B58, -1B64, -1B67, and -1B70 engine models: General Electric Document GEK 112858 and the Airworthiness Limitations Section of the GENx Engine Manual, GEK 112851, which defines the various configurations and maximum operating intervals.

注 14/NOTE 14 持续适航文件 /INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

保留。/Reserved.

注 15/NOTE5 风扇叶片修理 /FAN BLADE REPAIR

风扇叶片根部区到内环气流通道复合材料修理的批准必须与FAA发动机审定办公室协调。

/Approval of repairs of the fan blade composite material in the root section of the fan blade up to the inner annulus flow path line must be coordinated with the FAA Engine Certification Office.

修理必须表明符合GENx-1B专用条件33-006。 /Substantiation of the repairs must show that compliance to GENx-1B Special Condition No. 33-006-SC is maintained.

注 16/NOTE16 排放 /EMISSIONS

2007年12月31日以后生产的以下型号发动机满足14 CFR Part 34（1990年9月10日生效），包括34-1至34-4修正案。/The following engine models manufactured after December 31, 2007 comply with 14 CFR Part 34 effective September 10, 1990, as amended by 34-1 through 34-4:

GENx-1B54, -1B58, -1B64, -1B67, 和-1B70

GENx-1B54, -1B58, -1B64, -1B67, and -1B70

此外，发动机制造商声明已表明符合ICAO附件16排放标准，第II卷，第3版（也称为CAEP/6）。FAA没有对此进行验证。FAA按CFR进行符合性判定，而不是ICAO标准。关于排放符合性声明见本TCDS审定基础部分。

Additionally, the engine manufacturer has declared that the ICAO emissions standards of Annex 16, Volume II, Third edition, (also known as CAEP/6) have also been demonstrated. This has not been verified by the FAA. The FAA finds compliance to the Code of Federal Regulations (CFR) and not ICAO standards. See the Certification Basis section of this TCDS for the emissions compliance statement.

注 17/NOTE17 进气系统结冰 /INDUCTION SYSTEM ICING

对于14 CFR Part 33中33.68进气系统结冰的符合性验证，是专门针对安装于波音B787-3, -8, 和-9

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型飞机的GENx-1B54, -1B58, -1B64, -1B67, 和-1B70型号发动机。这些型号发动机安装于其他不同的飞机型号需要单独评估和判定对33.68的符合性。

Demonstration of compliance to 14 CFR Part 33 Section 33.68, Induction System Icing, is installation specific to the Boeing B787-3, -8, and -9 model(s) aircraft for the GENx-1B54, -1B58, -1B64, -1B67, and -1B70 engine models. Installation of these engine models on different airplane models or type will require a separate evaluation and finding of compliance to Section 33.68.

注 18/NOTE 18 吞鸟能力 /BIRD INGESTION CAPABILITY

GE成功完成了5.5磅鸟吸入试验，表明GENx-1B54, -1B58, -1B64, -1B67, 和-1B70型号发动机具有额外的吞鸟能力。

GE successfully conducted a 5.5-pound bird ingestion test that demonstrated additional bird ingestion capability for the GENx-1B54, -1B58, -1B64, -1B67, and -1B70.

注 19/NOTE 19 飞机型号 /AIRCRAFT MODELS

关于安装功率响应特性，GENx-1B54, -1B58, -1B64, -1B67, 和-1B70型号发动机仅限于安装在波音B787-3, -8, 和-9型飞机上。任何对功率响应有重大和不利影响的材料清单更改都必须重新评估。

The GENx-1B54, -1B58, -1B64, -1B67, and -1B70 engine models are limited to installation on the Boeing B787-3, -8, and -9 model(s) aircraft only with respect to the installed power response characteristics. Any bill-of-material changes that could significantly and adversely affect power response will have to be reassessed.

注 20/NOTE 20 商用发动机作为军用 /COMMERCIAL ENGINES IN MILITARY SERVICE

FAA审定合格的商用发动机作为军用时，不必按照型号设计审定基础或14 CFR中包含的联邦航空规章来运行或维护。已作为军用的GENx系列发动机或发动机部件再作商用时，必须有专门的事先FAA（发动机审定办公室，ANE-140）授权批准，否则禁止转为商用。

FAA-certified commercial engines in military service are not necessarily operated or maintained in accordance with the type design certification basis or Federal Aviation Regulations contained in CFR Title 14. Commercial-service use of GENx series engines or engine parts thereof that have operated in military applications is prohibited unless specific prior FAA (Engine Certification Office, ANE-140) approval is granted.

注 21/NOTE 21 双发延程运行(ETOPS) /EXTENDED TWIN ENGINE OPERATIONS (ETOPS)

GENx-1B54, -1B58, -1B64, -1B67, 和-1B70型号发动机（G03、G04和G05型号）符合14 CFR Part 33中33.4，附录A中A33.3(c), 33.71(c)(4), 和 33.201，因此有资格按照与ETOPS和早期ETOPS批准的飞机上。验证的改航时间为最大连续功率330分钟加上复飞功率15分钟等待时间。ETOPS资格不构成进行ETOPS飞行必要的飞机或运行批准。

The GENx-1B54, -1B58, -1B64, -1B67, and -1B70 engine models (defined by the G03, G04, and G05 model lists) comply with the requirements of 14 CFR Part 33, sections 33.4, Appendix A, A33.3(c), 33.71(c)(4), and 33.201, and are therefore eligible for installation on ETOPS and Early ETOPS approved

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airplanes. The demonstrated diversion time is 330 minutes at maximum continuous power plus 15 minutes at hold and go-around power. ETOPS eligibility does not constitute airplane or operational level approvals necessary to conduct ETOPS flights.

对于安装于B787飞机上的GENx-1B54, -1B58, -1B64, -1B67, 和-1B70型号发动机, 任何单一的超过30分钟吸力供油事件发生后, 必须在下一次ETOPS飞行前更换发动机燃油泵。吸力供油运行定义为发动机燃油泵进口燃油压力低于以下二者取较大者: 真实燃油蒸汽压力+5.0 psi或环境+ 5.0 psi。For the GENx-1B54, -1B58, -1B64, -1B67, and -1B70 engine models installed on B787 aircraft, the engine fuel pump must be replaced prior to the next ETOPS flight after any single suction feed operation event of duration greater than 30 minutes. Suction feed operation is defined by engine pump inlet fuel pressure less than the greater of true vapor pressure plus 5.0 psi or ambient plus 5.0 psi.

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