

型号认可证数据单

THE VALIDATION DATA SHEET

编号/No: VTC0190E

版次/Revision: 6

型号/Type:

Arriel 2B	Arriel 2B1	Arriel 2B1A
Arriel 2C	Arriel 2C1	Arriel 2C2
Arriel 2S1	Arriel 2S2	Arriel 2D
Arriel 2E	Arriel 2H	

批准人/Approved By:



职务/Title: Director General of CAAC-AAD

日期/Date: 2022 年 11 月 22 日

本数据单是型号认可证（编号：VTC0190E）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: VTC0190E), 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:

Safran Helicopter Engines

64510 Bordes

France

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	VTC0190E, 版次6, 2022年11月22日 VTC0190E, Revision 6, November 22, 2022	EASA.E.001, 第12版, 2021年2月26日 EASA.E.001, Issue 12, February 26, 2021
历史 History	VTC123E, 版次1, 2007年10月09日 No. VTC123E, Revision 1, October 09 2007	EASA.E.001, 第4版, 2007年2月12日 EASA.E.001, Issue 4, February 12, 2007
	VTC0190E, 版次2, 2008年7月11日 No. VTC0190E, Revision 2, July 11, 2008	EASA.E.001, 第4版, 2007年2月12日 EASA.E.001, Issue 4, February 12, 2007
	VTC0190E, 版次3, 2012年4月26日 No. VTC0190E, Revision 3, April 26, 2012	EASA.E.001, 第6版, 2011年5月16日 EASA.E.001, Issue 6 May 16, 2011
	VTC0190E, 版次4, 2016年10月20日 No. VTC0190E, Revision 4, October 20, 2016	EASA.E.001, 第7版, 2012年12月17日 EASA.E.001, Issue 7, December 17, 2012
	VTC0190E, 版次5, 2019年1月28日 No. VTC0190E, Revision 5, January 28, 2019	EASA.E.001, 第11版, 2018年4月5日 EASA.E.001, Issue 11, April 5, 2018

注：上表中出口国局方型号合格证数据单信息仅供参考/ Note: Above TCDS information of Certification Authority is only for reference.

CAAC 认可数据单修订情况说明 / CAAC VTCDS Change Record

CAAC 认可数据单版次/ CAAC VTCDS Revision	相对上一版次的修订情况/ CAAC VTCDS Change Record	备注 /Remark
Rev 6	1. 修改了Arriel 2E型号发动机的燃气发生器排气温度T45限值和对应的扭矩限值。 Arriel 2E, Revised Operating Limits for T45 with associated Torque limits. 2. 3号喷气燃料标准由“GB6537-2006”升级为“GB6537” / Standard of No.3 Jet Fuel updated from “GB6537-2006” to “GB6537”	

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: 欧盟航空安全局/EASA
4. 型号合格证持有人/Type Certificate Holder: Safran Helicopter Engines.
64510 Bordes France
5. 双发延程飞行/ETOPS: 不适用/NA
6. CAAC专用要求/CAAC Special Requirements: 中华人民共和国国家标准“3号喷气燃料”(GB 6537)
National Standard of the People's Republic of China
“No.3 Jet Fuel”(GB 6537)

第2部分 数据单

Section 2 DATA SHEET

I. 总则/General

1. 型号/型别/Type/Model/Variants

型别/Model	安装/Installation
Arriel 2B	单发直升机 Single-engine helicopters
Arriel 2B1	
Arriel 2B1A	
Arriel 2D	
Arriel 2C	双发直升机 Twin-engine helicopters
Arriel 2C1	
Arriel 2C2	
Arriel 2S1	
Arriel 2S2	
Arriel 2E	
Arriel 2H	

2. 型号合格证持有人/Type Certificate Holder

Safran Helicopter Engines
64510 Bordes
France

To 18 July 2016: Turbomeca
After 18 July 2016: Safran Helicopter Engines

3. 制造商/Manufacturer

To 18 July 2016: Turbomeca
After 18 July 2016: Safran Helicopter Engines

4. 申请日期/Date of Application

型别/Model	申请日期/Application Date
Arriel 2B	1996 年 12 月 09 日/ 09 December 1996
Arriel 2B1	1998 年 06 月 03 日/ 03 June 1998

Arriel 2B1A	2002 年 06 月 07 日/ 07 June 2002
Arriel 2D	2008 年 5 月 26 日/26 May 2008
Arriel 2C	1996 年 12 月 09 日/ 09 December 1996
Arriel 2C1	1997 年 9 月 10 日/10 September 1997
Arriel 2S1	1993 年 5 月 14 日/14 May 1993
Arriel 2C2	1999 年 1 月 12 日/12 January 1999
Arriel 2S2	2003 年 12 月 04 日/ 04 December 2003
Arriel 2E	2010 年 06 月 30 日/30 June 2010
Arriel 2H	2015 年 03 月 05 日/05 March 2015

5. EASA 型号合格审定日期/EASA Type Certification Date

型别/Model	EASA 型号合格审定日期/EASA Certification Date	注/Note
Arriel 2B	1997 年 12 月 01 日/ 01 December 1997	(1)
Arriel 2B1	2000 年 11 月 15 日/ 15 November 2000	(1)
Arriel 2B1A	2003 年 12 月 11 日/ 11 December 2003	(1)
Arriel 2D	2011 年 5 月 16 日/ 16 May 2011	
Arriel 2C	1997 年 8 月 29 日/ 29 August 1997	(1)
Arriel 2C1	1998 年 12 月 08 日/ 08 December 1998	(1)
Arriel 2S1	1996 年 4 月 26 日/ 26 April 1996	(1)
Arriel 2C2	2002 年 7 月 05 日/ 05 July 2002	(1)
Arriel 2S2	2005 年 12 月 06 日/ 06 December 2005	(1)
Arriel 2E	2012 年 12 月 17 日/17 December 2012	
Arriel 2H	2018 年 04 月 05 日/05 April 2018	

注(1): EASA 根据欧盟委员会规章(EU) 748/2012 第 3 款段 1(a)的授权, 在法国民航局 (DGAC) 对这些产品合格审定 (法国型号合格证编号 M19) 的基础上, 对上述型号进行的型号合格审定。

Note (1):EASA type certification for these models is granted in accordance with Article 3 paragraph 1(a) of EU Commission Regulation (EU) 748/2012, based on the DGAC France certification of these products (French Type Certificate N° M19).

II. 审定基础/Certification Basis

1. 确定适用适航要求的参照日期

Reference Date for Determining the Applicable Airworthiness Requirements

型别/Model	参照日期/Reference Date
Arriel 2B	1996 年 12 月 09 日/ 09 December 1996

Arriel 2B1	1998 年 06 月 03 日/ 03 June 1998
Arriel 2B1A	2002 年 06 月 07 日/ 07 June 2002
Arriel 2D	2008 年 5 月 26 日/26 May 2008
Arriel 2C	1996 年 12 月 09 日/ 09 December 1996
Arriel 2C1	1997 年 9 月 10 日/10 September 1997
Arriel 2S1	1993 年 5 月 14 日/14 May 1993
Arriel 2C2	1999 年 1 月 12 日/12 January 1999
Arriel 2S2	2003 年 12 月 04 日/ 04 December 2003
Arriel 2E	2010 年 06 月 30 日/30 June 2010
Arriel 2H	2015 年 03 月 05 日/05 March 2015

2. 设计国 (EASA) 的审定基础/State of Design Authority (EASA) Certification Basis

2.1 适航标准/Airworthiness Standards

型号/Model	适航标准/ Airworthiness Standards
Arriel 2B	1994年10月21日生效的JAR-E Change 9, 1996年8月8日生效的橙色页 E/96/1。 /JAR-E Change 9 dated 21 October 1994, Orange Paper E/96/1 dated 08 August 1996
Arriel 2B1	
Arriel 2B1A	
Arriel 2D	1994年10月21日生效的JAR-E Change 9, 1996年8月8日生效的橙色页 E/96/1, 1997年12月30日生效的橙色页E/97/1, 1999年8月15日生效的JAR-E Change 10 中的JAR-E 740和E 745, 2007年12月10日生效的CS-E第一版中的CS-E 50 (d) 和(f)与CS-E 1030, 2009年12月18日生效的CS-E第二版中的CS-E 570。 /JAR-E Change 9 dated 21 October 1994, Orange Paper E/96/1 dated 08 August 1996, Orange Paper E/97/1 dated 30 December 1997, JAR-E 740 and E 745 of JAR-E Change 10 dated 15 August 1999, CS-E 50 (d) and (f), and CS-E 1030 of CS-E Amendment 1 dated 10 December 2007, CS-E 570 of CS-E Amendment 2 dated 18 December 2009
Arriel 2C	1994年10月21日生效的JAR-E Change 9, 1996年8月8日生效的橙色页 E/96/1。 /JAR-E Change 9 dated 21 October 1994, Orange Paper E/96/1 dated 08 August 1996
Arriel 2C1	
Arriel 2S1	
Arriel 2C2	1994年10月21日生效的JAR-E Change 9, 1996年8月8日生效的橙色页 E/96/1, 1997年12月30日生效的橙色页E/97/1。 /JAR-E Change 9 dated 21 October 1994, Orange Paper E/96/1 dated 08 August 1996, Orange Paper E/97/1 dated 30 December 1997
Arriel 2S2	
Arriel 2E	1994年10月21日生效的JAR-E Change 9, 1996年8月8日生效的橙色页

Arriel 2H	E/96/1, 1997年12月30日生效的橙色页E/97/1, 1999年8月15日生效的JAR-E Change 10中的JAR-E 740和E 745, 2001年11月1日生效的JAR-E第11版中的JAR-E 820, 2003年5月1日生效的JAR-E第12版中的JAR-E 20、JAR-E 25、JAR-E 30、JAR-E 40、JAR-E 50、JAR-E 60、JAR-E 140 (d)(3)、JAR-E 170、JAR-E 690、JAR-E 730、JAR-E 740、JAR-E 830和JAR-E 920, 2007年12月10日生效的CS-E第一版中的CS-E 50 (d)和(f)与CS-E 1030, 2009年12月18日生效的CS-E第二版中的CS-E 570。 /JAR-E Change 9 dated 21 October 1994, Orange Paper E/96/1 dated 08 August 1996, Orange Paper E/97/1 dated 30 December 1997, JAR-E 745 of JAR-E Change 10 dated 15 August 1999, JAR-E 820 of JAR-E Amendment 11 dated 1 November 2001, JAR-E 20, JAR-E 25, JAR-E 30, JAR-E 40, JAR-E 50, JAR-E 60, JAR-E 140 (d)(3), JAR-E 170, JAR-E 690, JAR-E 730, JAR-E 740, JAR-E 830 and JAR-E 920 of JAR-E Amendment 12 dated 1 May 2003 CS-E 50 (d) and (f), and CS-E 1030 of CS-E Amendment 1 dated 10 December 2007, CS-E 570 of CS-E Amendment 2 dated 18 December 2009
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2.2 专用条件/Special Conditions (SC)

型号/Model	专用条件/Special conditions
Arriel 2B, 2B1,2B1A	无/None
Arriel 2D	SC1: 涡轴30分钟额定起飞功率的批准 SC1: Approval of Turboshaft 30-minute Take-off Power Rating
Arriel 2C	SC1至SC12: 30秒,2分钟和连续OEI功率批准的专用条件
Arriel 2C1	SC1 to SC12: Special Conditions for approval of the 30-Second, 2-minute and Continuous OEI ratings
Arriel 2S1	SC1至SC12: 30秒,2分钟和连续OEI功率批准的专用条件 SC13至SC15: HIP/SARM功率批准的专用条件 SC1 to SC12: Special Conditions for approval of the 30-Second, 2-minute and Continuous OEI ratings SC13 to SC15: Special conditions for approval of the HIP/SARM rating
Arriel 2C2	SC1-C2: 30秒和2分钟OEI功率审定的专用条件
Arriel 2S2	SC2-C2: : HIP/SARM功率审定的专用条件 SC1-C2: Special Conditions for certification of “30 second and 2 minutes OEI ratings” SC2-C2: Special Condition for certification of HIP/SARM rating
Arriel 2E	SC1: 涡轴30分钟额定起飞功率的批准 SC1: Approval of Turboshaft 30-minute Take-off Power Rating
Arriel 2H	SC1: 涡轴30分钟额定起飞功率的批准 SC1: Approval of Turboshaft 30-minute Take-off Power Rating

2.3. 等效安全/Equivalent Safety Findings

型号/Model	等效安全条款/Equivalent Safety Findings
Arriel 2B, 2B1, 2B1A	JAR-E 740 持久试验/ JAR-E 740 Endurance test
Arriel 2C, 2S1, 2C2, 2S2, 2E, 2D, 2H	无/none
Arriel 2C1	JAR-E 80, E740 “双通道控制系统持久试验” JAR-E 80, E740 “Dual channel control system endurance”

2.4. 偏离/Deviations

型号/Model	偏离/Deviations
Arriel 2B, 2B1, 2B1A	JAR-E 5700 (a)(4)(ii) 和 (5)(ii)-机组人员指示 JAR-E 570 (a)(4)(ii) and (5)(ii) - Indication to the flight crew
Arriel 2D, 2E, 2H	无/none
Arriel 2C, 2C1, 2S1, 2C2, 2S2,	JAR-E 5700 (a)(4)(ii) 和 (5)(ii)-机组人员指示 JAR-E 570 (a)(4)(ii) and (5)(ii) - Indication to the flight crew

2.5. 环境保护/Environmental Protection

型号/Model	环境保护/Environmental Protection
Arriel 2B, 2B1, 2B1A	国际民航组织附件16第二卷第2部分第2章（1993年版）的燃油排放规定 Fuel venting provisions of ICAO Annex 16, vol II, Part 2, Chapter 2 (Edition 1993)
Arriel 2D	国际民航组织附件16第二卷第二部分第二章第6修正案（2008年11月20日生效）的环境保护要求，适用于涡轮轴发动机 Environmental protection requirements of ICAO Annex 16 Volume II, Part II, Chapter 2 Amendment 6 effective 20 November 2008, as applicable to turboshaft engines.
Arriel 2C, 2C1, 2S1, 2C2	国际民航组织附件16第二卷第2部分第2章（1993年版）的燃油排放规定 Fuel venting provisions of ICAO Annex 16, vol II, Part 2, Chapter 2 (Edition 1993)
Arriel 2S2	环境保护要求按欧盟规章（EC）1702/2003中 21A.18（b） Environmental protection requirements of 21A.18(b) of Regulation (EC) 1702/2003
Arriel 2E	国际民航组织附件16第二卷第二部分第二章修正案6（2008年11月20日生效）的环境保护要求，适用于涡轮轴发动机。 Environmental protection requirements of ICAO Annex 16 Volume II, Part II, Chapter 2 Amendment 6 effective 20 November 2008, as applicable to turboshaft engines.
Arriel 2H	2007年12月10日CS-E修正案1的CS-E 1010，依据CS-34.1 2013年1月23日的第1修正案 CS-E 1010 of CS-E Amendment 1 dated 10 December 2007 iaw CS-34.1

Amendment 1 dated 23 January 2013

2.6. CAAC 认可审定基础/CAAC Validation Basis:

CAAC 接受 EASA 的审定基础为认可审定基础

CAAC accept EASA certification basis as validation basis

III. 技术特性/Technical Characteristics**1. 型号设计定义/Type Design Definition**

型别/Model	件号/Part Number
Arriel 2B	0 292 00 534 0
Arriel 2B1	0 292 00 541 0
Arriel 2B1A	0 292 00 547 0
Arriel 2D	0 292 00 002 0
Arriel 2C	0 292 00 536 0
Arriel 2C1	0 292 00 539 0
Arriel 2C2	0 292 00 542 0
Arriel 2S1	0 292 00 531 0
Arriel 2S2	0 292 00 545 0
Arriel 2E	0 292 00 001 0
Arriel 2H	0 292 00 009 0

2. 描述/Description

ARRIEL 2 系列发动机是涡轴发动机，包括轴流式进气道、轴流压气机、单级涡轮驱动的离心压气机、燃烧室、驱动位于后端的减速齿轮箱的单级动力涡轮。位于前端的附件齿轮箱由燃气发生器驱动。发动机挂架是发动机型号定义的一部分，起动发电机不是发动机型号定义的一部分。

ARRIEL 2 系列发动机由发动机电子控制系统控制，由具体型号而异（参见第 III.7 节），包括单通道或者双通道带有标准或可选的机械备份。

The Arriel 2 engine is a turboshaft engine consisting of an axial air intake, an axial compressor and a centrifugal compressor driven by a single stage turbine, a combustion chamber, and a single stage power turbine driving a reduction gearbox located at the rear. An accessory drive gearbox, driven by the gas generator, is located at the front. Mounts are part of the engine type definition. Starter-generator is not part of the engine type definition.

The Arriel 2 engine is controlled by an electronic engine control system, featuring a single or dual channel with standard or optional mechanical back-up depending on the model (see section III.7).

3. 设备/Equipment

发动机设备包含在型号设计定义中。

Equipment is included in Type Design Definition.

4. 尺寸/Dimensions

型号/Model	长/Length (m)	高/Height (m)	宽/Width (m)
Arriel 2B	1.181	0.616	0.498

Arriel 2B1	1.140	0.616	0.491
Arriel 2B1A			
Arriel 2D	1.177	0.616	0.500
Arriel 2C	1.181	0.616	0.498
Arriel 2C1	1.015	0.576	0.498
Arriel 2C2			
Arriel 2S1	1.539	0.715	0.504
Arriel 2S2			0.497
Arriel 2E	1.182	0.616	0.508
Arriel 2H	1.201	0.617	0.500

5. 干重/Dry Weight

型号/Model	干重 (千克) /Dry Weight (Kg)	备注
Arriel 2B	134.0	(1)
Arriel 2B1	132.2	
Arriel 2B1A	129.2	(2)
Arriel 2D	132.9	(2)
Arriel 2C	131.0	
Arriel 2C1	129.2	
Arriel 2C2	131.5	
Arriel 2S1	131.2	
Arriel 2S2	131.0	
Arriel 2E	139.2	
Arriel 2H	135.0	

备注/Note (1): 飞轮由直升机负责, 重量包括飞轮总成。/ Free wheel is under helicopter responsibility, and weight includes free wheel assembly

备注/Note(2): 飞轮由直升机负责, 重量不包括飞轮总成。/ Free wheel is under helicopter responsibility, but weight does not include free wheel assembly

6. 额定值/Ratings

额定功率 Ratings kW	最长持续时间 Maximum duration	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
30分钟起飞 /30-minute Take-off (1)	30分钟/30 minutes	NA	NA	NA	598
起飞/Take-off	5分钟/5 minutes	557	557	501	598
最大连续 /Maximum continuous	无限制/unlimited	543	543	501	598

额定功率/ Ratings-Power(kW)	最长持续 时间/ Maximum duration	Arriel 2C	Arrel 2C1	Arriel 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E	Arriel 2H
30秒OEI/30 seconds OEI	30秒/30 seconds	704	718	750	735	771	753	704
2分钟OEI/2 minutes OEI	2分钟/2 minutes	635	646	713	663	699	630	635
连续OEI/OEI Continuous	无限制 /unlimited	610	616	640	639	659	490	610
30分钟起飞/ 30-minute Take-off (1)	30分钟/30 minutes	n/a	n/a	612	601	601	445	495
起飞/Take-off	5分钟/5 minutes	531	581	612	601	601	445	495
最大连续 /Maximum continuous	无限制 /unlimited	531	531	612	592	601	360	460.5

备注/ Note (1): 早期型号中又称为悬停增大功率/搜救任务/ Also called HIP/SARM in earlier models

附加备注/ Additional Notes:

以上规定的性能值对应于下列条件中定义的最小值/The performance values specified above correspond to minimum values defined under the following conditions:

- 除ARRIEL 2H外, 所有型号压气机进气平面内的平均漩涡角小于或等于0.5°/mean swirl angle in the compressor air intake plane less than or equal to 0.5° for all models except Arriel 2H
- Arriel 2H发动机的压气机进气平面内的平均漩涡角介于-1.5°和+1.5°之间/mean swirl angle in the compressor air intake plane between -1.5° and +1.5° for 2H.
- 海平面标准条件下的试验台上/ ISA conditions at sea level, on test bed
- 发动机装有试验台进气和主要排气管/ engine equipped with a test bed air intake and primary exhaust pipe,
- 没有引气/no air bleed
- 除正常发动机运行必需的, 无任何附件提取功率/ no power drawn by any accessories other than those required for engine operation
- 无安装损失/no installation loss
- 输出轴旋转速度/Output shaft rotation speed
 - Arriel 2B, 2B1, 2B1A, 2D, 2C, 2C1, 2C2, 2E, 2H转速为6000rpm
/6000 rpm for 2B, 2B1, 2B1A, 2D, 2C, 2C1, 2C2, 2E, 2H;
 - Arriel 2S1, 2S2转速为6409rpm/6409 rpm for 2S1, 2S2
- 燃料最低热值/fuel Low Heat Value: 43 136 kJ/kg

声明的功率受限于热极限值或机械限制值中率先达到者/ Declared powers are limited by the first reached limit: either by thermal or mechanical limits.

对于起飞, 30 分钟起飞和最大连续状态, 机械限制如下: /For Take-Off, 30-minute Take-off and Maximum Continuous, the mechanical limits correspond to:

- 除Arriel 2E外, 所有型号的第一个扭矩限制介于所验证的机械限制和EECU扭矩限制之间/
the first torque limits reached between validated mechanical limit and EECU torque limit for all variants but Arriel 2E;
- Arriel 2E所验证的机械限制/ the validated mechanical limit of the engine for Arriel 2E

7. 控制系统/Control System

型号/Model	控制系统/Control system
Arriel 2B	单通道发动机电子控制系统,装有手动备用控制 Single channel electronic engine control system with manual backup control
Arriel 2B1, 2B1A	双通道发动机电子控制系统,装有可选的辅助备用控制 Dual channel electronic engine control system with optional auxiliary back-up control
Arriel 2D	双通道发动机电子控制系统,装有辅助备用控制 Dual channel electronic engine control system with auxiliary back-up control
Arriel 2C	单通道发动机电子控制系统,装有手动备用控制 Single channel electronic engine control system with manual backup
Arriel 2C1, 2C2	双通道发动机电子控制系统,装有可选的辅助备用控制 Dual channel electronic engine control system with optional auxiliary back-up control
Arriel 2S1	单通道发动机电子控制系统,装有手动备用控制 Single channel electronic engine control system with manual backup control
Arriel 2S2	双通道发动机电子控制系统,装有辅助备用控制 Dual channel electronic engine control system with auxiliary back-up control
Arriel 2E	双通道发动机电子控制系统 Dual channel electronic engine control system
Arriel 2H	双通道发动机电子控制系统 Dual channel electronic engine control system

8. 液体（燃油、滑油、冷却剂、添加剂）/Fluids (Fuel, Oil, Coolant, Additives)

参见安装手册/ See Installation Manual

9. 航空器附件传动装置/Aircraft Accessory Drives

起动发电机输出/Starter-generator Output							
型号 /Model	旋转方 向/ Rotation	旋转速度 /Rotation speed (rpm)	过载时最 大 扭矩/ Maximum (daNm)	最大静悬 吊/ Maximum (daNm)	保护轴断裂扭 矩/ Fuse shaft breakaway (daNm)	最大永久轴功率/ Maximum Permanent Shaft Power (kW)	
						双发 /Twin Engine	OEI状态 /OEI situation

Arriel 2B, 2B1, 2B1A	顺时针 /CW	11330	5.0	2.5	9.5	7.5	n/a
Arriel 2D			5.15			9.0	
Arriel 2C, 2C1	顺时针 /CW	11330	5.0	2.5	9.5	3.5	5.0
Arriel 2C2						5.0	
Arriel 2S1						7.5	7.5
Arriel 2S2			7.5(1)				
Arriel 2E			5.15	1.0		12.0(2)	
Arriel 2H						12.0(2)	

备注 / Note (1):对于 ARRIEL 2S2,在特定的飞行条件下 OEI 计数的具体说明, 参见维护手册和安装手册中适航限制章节。/for Arriel 2S2: refer to Installation Manual and Airworthiness Limitation Section of the Maintenance Manual for specific instructions relative to OEI counting in certain flight conditions

备注/ Note (2): 对于 ARRIEL 2E 和 2H, 失效状态下轴功率提取的详细信息, 参见安装和操作手册了解。/ for Arriel 2E and 2H: Refer to Installation and Operating Manual for detailed power shaft extraction in case of failure.

风扇冷却器驱动输出/Fan Cooler Drive Output							
型号 /Model	旋转方 向/ Rotation	旋转速 度 /Rotation rpm	过载时最 大 扭矩/ Maximum DaNm	最大静悬 吊/ Maximum DaNm	保护轴断 裂扭矩/ Fuse shaft DaNm	最大永久轴功率/ Maximum Permanent Shaft Power (kW)	
						双发/Twin Engine	OEI状态 /OEI situation
Arriel 2C2	逆时针 /CCW	11452	1.0	1.5	10.0	1.5	1.5
Arriel 2S1,2S2		12253					
Arriel 2H		11470	1.5	0.251			

附加备注/ Additional Notes:

- CW:顺时针/ clockwise
- CCW:逆时针/ counter clockwise
- 从外侧看动力传动装置所指示的旋转方向。/The rotation direction of the power drives for the accessories is indicated considering the power drive seen from the outside.
- 从发动机后端看转子的旋转方向, 有关更多详细信息, 参见安装手册/ The rotation direction of the engine rotors is indicated with respect to viewing the engine from its rear end. For further details see Installation Manual

10. 最大允许引气/Maximum Permissible Air Bleed Extraction

P3 为飞机提供引气, 海平面条件下最大引气量: /P3 air bleed for aircraft use. Maximum flow rate at standard sea level conditions::

除了 Arriel 2D,2E 和 2H,其余型号在额定起飞状态下为 100g/s,在最大连续状态下为 98g/s

Arriel 2D,2E 和 2H 在最大连续状态,起飞状态和 30 分钟额定起飞状态下均为 150g/s。

更多信息参见安装手册。

/P3 air bleed for aircraft use. Maximum flow rate at standard sea level conditions:

All Models except Arriel 2D, 2E and 2H: 100 g/s at Take-off rating and 98 g/s at Maximum Continuous rating

Arriel 2D, 2E and 2H : 150 g/s at Maximum Continuous, Take-Off and 30-minute Take-off ratings.

For further details, see Installation Manual.

IV. 使用限制/Operating Limitations

1. 温度限值/Temperature Limits

1.1. 燃气发生器排气温度 (T45) 限值/Gas Generator Exhaust Temperature (T45) Limits

起动状态/on start-up

T45(°C)	Arriel 2B	Arriel 2B1	Arriel	Arriel 2D
无限制/for an unlimited duration	750			
最大超温(< 10s)/maximum overtemperature (< 10 s)	865			840

T45 (°C)	Arriel 2C	Arriel 2C1	Arriel 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E/2H
无限制/for an unlimited duration	750					760
最大超温 (< 10s)/maximum overtemperature (< 10 s)	865	840	865	840	840	840

飞行状态/in flight:

T45 (°C)	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
30 分钟起飞/30-minute Take-off (1)	n/a			962
起飞/Take-off	915			962
最大连续/Maximum continuous	849			918
最大意外超温 (< 20s)/Maximum inadvertent overtemperature (<20 sec)	941			994

T45 (°C)	Arriel 2C,2C1	Arriel 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E	Arriel 2H
30秒OEI/ OEI -30 sec	1000	996	1000	996	1035	1047
2分钟OEI/ OEI -2 min	941	944	941	944	1016	980
连续OEI/ OEI Continuous	912	926	912	926	974	954
30 分钟起飞/30-minute Take-off (1)	n/a	929	912	930	947	955
起飞/Take-off	912	929	912	930	947	955
最大连续/Maximum continuous	877	891	877	893	930	921
最大意外超温 (< 20s)/Maximum inadvertent overtemperature (<20 sec)	n/a				974(2)	980 (2)

备注/ Note (1) : 早期型号中又称为悬停增大功率/搜救任务/ Also called HIP/SARM in earlier models

备注/ Note (2) : 所有发动机工作/ all engines operating

1.2. 燃油温度/Fuel Temperature

最高温度参见安装手册/ Maximum temperature: see Installation Manual

发动机最小起动温度参见安装手册/ Minimum temperature for engine starting: see Installation Manual

使用防冰添加剂的燃油温度/ Use of anti-icing additive for fuel temperature:

Arriel 2B,2B1,2B1A,2C,2D,2C1,2S1,2E,2H 低于零下 20°C /< -20°C for Arriel 2B, 2B1, 2B1A, 2C, 2D, 2C1, 2S1, 2E, 2H

Arriel 2C2, 2S2 低于零下 30°C /< -30°C for Arriel 2C2, 2S2

1.3 滑油温度/Oil temperature

发动机起动最小滑油温度/Minimum oil temperature for engine starting:

对于运动粘度为 5×10^{-6} m²/s 的滑油/For oil with a 5×10^{-6} m²/s kinematic viscosity:

发动机起动/For engine starting -30°C

发动机功率增加/For power-up 0°C

对于运动粘度为 $3-4.9 \times 10^{-6}$ m²/s 的滑油/For oil with a 3 to 4.9×10^{-6} m²/s kinematic viscosity:

发动机起动/For engine starting -45°C (对于 2B,2B1,2B1A)

-50°C (对于其他型号发动机)

发动机功率增加/For power-up -10°C

最大滑油温度/Maximum oil temperature:

除了 Arriel 2D 和 2E, 其他型号发动机为 115°C /115°C for all Models except Arriel 2D, 2E

Arriel 2D, 2E 和 2H 为 117°C (测量位置与其他型号发动机不同)/117°C for Arriel 2D, 2E and 2H (measured at a different location from other Models)

2. 速度限值/Speed Limits

2.1. 燃气发生器转速/Gas Generator Speed (N1)

100 % N1 = 52 110 rpm

N1 最小稳定转速/ Minimum stabilised N1 speed

N1 最小稳定转速/ Minimum stabilised N1 speed	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
慢车模式转速范围/ IDLE mode speed range	67 % to 68 % (34 914 to 35 435 rpm)			
飞行模式(手动控制模式) FLIGHT mode (manual control mode)	62% (32 308 rpm)			

N1 最小稳定转速/ Minimum stabilised N1 speed	Arriel 2C	Arriel 2C1	Arriel 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E	Arriel 2H
慢车模式转速范围/ IDLE mode speed range	67 % to 68 % (34 914 to 35 435 rpm)			48 % to 52 % (25 013 to 27 097 rpm)		62 % (32 308 rpm)	
飞行模式(手动控制模式) FLIGHT mode (manual control mode)	62 % (32 308 rpm)			62 % (32 308 rpm)		62 % (32 308 rpm)	

N1 最大稳定转速/ Maximum stabilised N1 speed

N1 最大稳定转速 / Maximum stabilised N1	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
30 分钟 起飞 /30-minuten/a Take-off (1)				101.87% (53 086 rpm)
起飞/Take-off	101.24 % (52 756 rpm)			101.87% (53 086 rpm)
最大连续 /Maximum continuous	97.24 % (50 672 rpm)			99.88% (52 050 pm)

备注/ Note (1) : 早期型号中又称为悬停增大功率/搜救任务/ Also called HIP/SARM in earlier models

N1 最大稳定转速 / Maximum stabilised N1	Arriel 2C	Arriel 2C1	Arriel 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E	Arriel 2H
30秒OEI/ OEI -30 sec	105.6 % (55 051 rpm)	105.52 % (54 986 rpm)	106.05 % (55 265 rpm)	105.8 % (55 156 rpm)	105.89 % (55 178 rpm)	105.90 % (55 186 rpm)	107.48 % (56 010 rpm)
2分钟OEI/ OEI -2 min	102.1 % (53 192 rpm)	101.95 % (53 126 rpm)	102.24 % (53 275 rpm)	102.4 % (53 386 rpm)	102.38 % (53 348 rpm)	104.54 % (54 480 rpm)	103.40 % (53 884 rpm)
连续OEI/ OEI Continuous	100.9 % (52 571 rpm)	100.76 % (52 506 rpm)	101.26 % (52 764 rpm)	101.2 % (52 756 rpm)	101.28 % (52 776 rpm)	101.90 % (53 102 rpm)	102.32 % (53 320 rpm)

30 分钟起飞/30-minuten Take-off (1)	n/a	n/a	101.86 % (53 079	101.2 % (52 756	101.88 % (53 089	100.78 % (52 518	102.61 % (53472
起飞/Take-off	101.1 % (52 660 rpm)	101.27 % (52 776 rpm)	101.86 % (53 079 rpm)	101.2 % (52 756 rpm)	101.88 % (53 089 rpm)	100.78 % (52 518 rpm)	102.61 % (53472 rpm)
最大连续 /Maximum continuous	98.9 % (51 520 rpm)	99.09 % (51 637 rpm)	99.64 % (51 922 rpm)	99.1 % (51 616 rpm)	99.71 % (51 959 rpm)	98.96 % (51 572 rpm)	100.91 % (52583 rpm)

备注/ Note (1) : 早期型号中又称为悬停增大功率/搜救任务/ Also called HIP/SARM in earlier models

瞬态转速/Transient speeds

瞬态转速/Transient speeds	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
最大意外超转 /Maximum inadvertent over-speed (< 20 sec)	102.3 % (53 312 rpm)			102.97% (53 658 rpm)

瞬态转速/Transient speeds	Arriel 2C	Arriel 2C1	Arriel 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E	Arriel 2H
慢车转换至飞行模式/ Transfer from IDLE to FLIGHT mode	n/a			52 % to 62 % (27 097 to 32 308 rpm) Note (1)		n/a	
最大意外超转 /Maximum inadvertent over-speed (< 20 sec)	102.3 % (53 312 rpm)			102.3 % (53 312 rpm) Note (2)	102.98 % (53 661 rpm) Note (2)	101.90 % (53 102 rpm) Note (2)	103.40 % (53884 rpm) Note (2)

备注/ Note (1) : 在此范围内避免连续运行/ avoid continuous operation in this range

备注/ Note (2): 所有发动机工作/ all engines operating

2.2. 动力涡轮转速/Power Turbine Speed (N2)

除了 Arriel 2D, 2E 和 2H 外, 其他型号 100 % N2 = 39 095 rpm /100 % N2 = 39 095 rpm for all Models except Arriel 2D, 2E and 2H.

Arriel 2D, 2E 和 2H 发动机 100 % N2 = 39 158 rpm /100 % N2 = 39 158 rpm for Arriel 2D, 2E, and 2H

最小 N2 转速—飞行模式

飞行模式最小 N2 转速/Minimum N2 Speed—Flight Mode	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
稳态功率开启 /Stabilised Power on	90.5 % (35 381 rpm)			90.5 % (35 437 rpm)
稳态功率关闭 /Stabilised Power off	85.0 % (33 230 rpm)			85 % (33 284 rpm)

瞬态 (小于 20 秒)/Transient (< 20 sec)	68.0 % (26 584 rpm)			68 % (26 627 rpm)
备注/Notes	(1)	(1)	(1) & (2)	n/a

Note (1): 地面运行时, 避免在 87.0% ~ 90.5%(34 012 ~ 35 381 rpm)转速范围内连续运行
/During ground run avoid continuous operation in the range 87.0 % to 90.5 % (34 012 to 35381 rpm)

Note (2): 对于 2B1A 型号,自动辅助备份模式的退出界限值 96.71 % (37 809 rpm)
/Minimum automatic auxiliary backup mode exit threshold is 96.71 % (37 809 rpm) for 2B1A

飞行模式最小 N2 转速 /Minimum N2 Speed– Flight Mode	Arriel 2C	Arriel 2C1	Arrie 1 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E	Arriel 2H
稳 态 功 率 开 启 /Stabilised Power on	90.5 % (35 381 rpm)			90.5 % (35 381 rpm)		90.5 % (35 437 rpm)	95.0 % (37200 rpm)
稳 态 功 率 关 闭 /Stabilised Power off	85.0 % (33 230 rpm)					85 % (33 284 rpm)	
瞬 态 (小 于 20 秒)/Transient (< 20 sec)	68.0 % (26 584 rpm)					68 % (26 627 rpm)	
注/Notes	(1)						

Note (1): 地面运行时, 避免在 87.0% ~ 90.5%(34 012 ~ 35 381 rpm)转速范围内连续运行/During ground run avoid continuous operation in the range 87.0 % to 90.5 % (34 012 to 35 381 rpm)

最大 N2 转速—飞行模式

飞行模式最大 N2 转速 /Maximum N2 Speed – Flight Mode	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
稳态/Stabilised	108.5 % (42 418 rpm)			108.48 % (42 477 rpm)
最大意外超转功率 (小于 20 秒) 开启 /Maximum inadvertent over-speed (< 20 sec) Power on	109.0 % (42 613 rpm)			108.8 % (42 613 rpm)
最大意外超转功率 (小于 20 秒)	121.0 % (47 305 rpm)			119.0 % (46 598 rpm)

秒) 关 闭 /Maximum inadvertent over- speed (< 20 sec) Power off		
注/Notes	n/a	(1)

Note (1): 自动辅助备份模式的退出界限值: 2B1 为 115.0 % (44 960 rpm), 2D 为 115.0 % (45 032 rpm)/Maximum automatic auxiliary backup mode exit threshold: 115.0 % (44 960 rpm) for 2B1, 115.0 % (45 032 rpm) for 2D

飞行模式最大 N2 转速 / Maximum N2 Speed – Flight Mode	Arriel 2C	Arriel 2C1	Arrie 1 2C2	Arrie 1 2S1	Arriel 2S2	Arriel 2E	Arriel 2H
稳态/Stabilised	108.5 % (42 418 rpm)					108.3 % (42 418 rpm)	108.39 % (42445 rpm)
最大意外超转(小于 20 秒)功率开/Maximum inadvertent over-speed (< 20 sec) Power on	109.0 % (42 613 rpm)				112.0 % (43 719 rpm)	119.0 % (46 598 rpm)	
最大意外超转(小于 20 秒)功率关/Maximum inadvertent over-speed (< 20 sec) Power off	121.0 % (47 305 rpm)					119.0 % (46 598 rpm)	

3. 推力/扭矩限值/Thrust / Torque Limits

在 N2 最小稳定转速下运行时,轴上最大扭矩/Maximum torque on shaft during operation at N2 minimum stabilized speed:

最大扭矩 /Maximum Torque (daNm)	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D(2)
30 分钟起飞/30-minute Take-off (1)	n/a			96.0
起飞/Take-off	91.3			96.0
最大连续 /Maximum continuous	91.3			96.0
最大无意超扭(小于 20 秒)/Maximum inadvertent over-torque (<20 sec)	132.2			134.2

Note (1): 在早期型号中也称为悬停增大功率/搜救任务 /Also called HIP/SARM in earlier models

Note (2): 自动辅助备份模式的退出界限值: 2B1 为 91.3 daNm, 2D 为 101.8 daNm/ Automatic auxiliary backup mode exit threshold: 91.3 daNm for 2B1, 101.8 daNm for 2D

最大扭矩 /Maximum Torque (daNm)	Arriel 2C	Arriel 2C1	Arriel 2C2	Arriel 2S1 and 2S2	Arriel 2E	Arriel 2H
30 秒 OEI/OEI-30 sec	116.8	118.7	119.3	120.3	119.8	112.1
2 分钟 OEI/OEI-2 min	107.3	107.9	116.0	113.2	100.3	101.1
连续 OEI/OEI Continuous	103.0	101.55	101.8	102.5	78.0	97.1
30 秒瞬时最大扭矩(小于 10 秒)/OEI-30 sec transient maximum torque (<10s) in case of under N2	n/a					n/a
30 分钟起飞/30-minute Take-off (1)	n/a		97.3	92.5	70.8	78.8
Take-off	92.5		97.3	92.5	70.8	78.8
最大连续 /Maximum continuous	92.5		97.3	92.5	57.3	73.3
最大无意超扭(小于 20 秒) /Maximum inadvertent over-torque (<20 sec)	132.2			143.0	116.0	84.5
注/Note	(2)			n/a	(3)	(4)

Note (1): 在早期型号中也称为悬停增大功率/搜救任务 /Also called HIP/SARM in earlier models

Note (2): 对于 Arriel 2C, 2C1, 2C2, 121.9 daNm 的扭矩限制对于不受限制的连续 OEI 已被认证,无需特殊的维护操作./For Arriel 2C, 2C1, 2C2, torque limit of 121.9 daNm has been validated for unlimited continuous OEI usage with no specific maintenance actions.

Note (3): 对于 Arriel 2E, 99.9 daNm 的扭矩限制对于不受限制的 AEO 已被认证,无需特殊的维护操作。/For Arriel 2E, the following torque limits have been validated with no specific maintenance actions: 99.9 daNm for unlimited AEO usage, and 119.8 daNm for unlimited continuous OEI usage.

Note (4): 对于 Arriel 2H, 999 N.m 的扭矩限制对于不受限制的 AEO 已被认证,无需特殊的维护操作;因此, AEO 最大瞬时扭矩的 20 秒持续极限适用于 999 N.m 以上, 最高可达到 1162 N.m。/For Arriel 2H, a torque limit of 999 N.m has been validated for unlimited AEO continuous usage with no specific maintenance action; as a consequence, the 20 second duration limit of the AEO maximum transient torque applies above 999 N.m, up to 1,162 N.m.

Additional Note: 上述扭矩值,对应于验证发动机扭矩极限与最小 N2 稳定时的 EECU 扭矩律极限之间,首先达到的扭矩极限值。/torques shown above correspond to the first reached torque limit between the validated engine torque limit and EECU torque law limit at minimum N2 stabilised.

4. 压力限值/Pressure Limits

4.1. 燃油压力/Fuel Pressure

最小燃油压力/Minimum fuel pressure

- 除了Arriel2D,2E和2H外, 其他型号发动机在正常操作过程中, 不包括起动阶段, 最小绝对压力由下列最高条件定义/ In normal operation, i.e. excluding starting phase, the minimum (absolute) pressure is defined for all models except Arriel 2D, 2E,
- and 2H, by the highest of the following conditions:
 - 20 kPa绝对压力/ 20 kPa absolute
 - 35%的大气压力/ 35 % of atmospheric pressure
 - 高于燃油蒸发压力7 kPa/ 7 kPa above the vapour pressure of the fuel used
 - 蒸汽体积与液体体积比为0.30的燃油压力/ Fuel pressure corresponding to a vapour volume over liquid volume ratio of 0.30.

对于 Arriel2D,2E 和 2H,参考安装手册和操作手册

- 在起动阶段或重新点火时(相对压力)/During starting phase or at relight (relative pressure):
- 对于除2S2以外的所有型号: 25kPa相对压力(即低于大气压力25 kPa)/For all models except 2S2: 25kPa relative pressure (i.e. 25 kPa below atmospheric pressure)
- 对于2S2发动机: 20kPa相对压力(即低于大气压力20 kPa) / 20kPa relative pressure (i.e. 20 kPa below atmospheric pressure)

最大燃油压力/Maximum fuel pressure

除 ARRIEL 2D、2E 和 2H 外, 所有型号在操作阶段均小于或等于 150 kPa (相对压力)/Less than or equal to 150 kPa (relative pressure), in all operating phases, for all Models except Arriel 2D, 2E and 2H.

对于 Arriel 2D、2E 和 2H, 在所有阶段小于或等于 180 kPa (相对压力)/Less than or equal to 180 kPa (relative pressure), in all operating phases, for Arriel 2D, 2E and 2H.

4.2. 滑油压力/Oil Pressure

压力限制/Pressure Limits (kPa)	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
最小滑油压力 /Minimum Oil Pressure	110			(1)
最大滑油压力 Maximum Oil Pressure	600			(1)
正常运行范围/Normal Operating Range	200 至 600			(1)

压力限制 /Pressure Limits (kPa)	Arriel 2C	Arriel 2C1	Arriel 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E and 2H
最小滑油压力/Minimum Oil Pressure	110	170	110	170		(1)
最大滑油压力 Maximum Oil Pressure	600					(1)
正常运行范围 /Normal Operating	200 至 600					(1)

Range		
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Note (1): 参考安装操作手册相关内容/ Refer to relevant Installation / Operating Manuals

V. 操作和服务指令/Operating and Service Instructions

文件/Document	Arriel 2B	Arriel 2B1	Arriel 2B1A	Arriel 2D
安装操作手册/Installation and Operating Manual (1)	X 292 M0 001 2	X 292 N5 001 2	X 292 P4 001 2	X 292 R1 001 2
性能简介/Performance Brochure	X 292 M5 001 9	X 292 N5 002 9	X 292 P4 001 9	AA04908 8
维 修 手 册 /Maintenance Manual	X 292 M5 450 2	X 292 N5 450 2	X 292 P4 450 2	X 292 R1 450 2
大 修 手 册 /Overhaul Manual	X 292 R1 500 2	X 292 R1 500 1		X 292 R1 500 2
服务信函与服务通告 /Service Letters and Service Bulletins	参考服务信函与服务通告指南/refer to SB and SL directory			

Note (1): 安装手册第 15 章有操作说明/Operating Instructions are provided in Installation Manual Chapter 15

文 件 /Document	Arriel 2C	Arriel 2C1	Arriel 2C2	Arriel 2S1	Arriel 2S2	Arriel 2E	Arriel 2H
安装操作手册 /Installation and Operating Manual (1)	X 292 M1 001 2	X 292 N4 001 2	X 292 N6 404 1	X 292 L0 001 1	X 292 P5 001 2	X 292 R2 001 2	X 292 2H 002 2
性能简介 /Performance Brochure	X 292 M1 001 9	X 292 N4 002 9	X 292 N6 002 9	X 292 L0 001 9	X 292 P5 001 9	AA056554	AA099838
维修手册 /Maintenance Manual	X 292 M1 450 2	X 292 N4 450 2	X 292 N6 450 2	X 292 L0 301 2	X 292 P5 451 2	X 292 R2 300 2	X 292 2H 450 2
大修手册 /Overhaul Manual	X 292 R1 500 2	X 292 R1 500 2	X 292 N6 500 2	X 292 R1 500 2	X 292 R1 500 2	X 292 R1 500 2	X 292 R1 500 2
服务信函与	参考服务信函与服务通告指南/refer to SB and SL directory						

服务通告 /Service Letters and Service Bulletins		
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Note (1): 安装手册第 15 章有操作说明/Operating Instructions are provided in Installation Manual Chapter 15

VI. 注释/Notes

1. ARRIEL 2B,2B1,2B1A,和2D发动机的安装仅适用于单发情况/ Arriel 2B, 2B1, 2B1A, 2D installation is approved for single-engine application only.
2. Arriel 2C, 2C1, 2C2, 2S1, 2S2, 2E和 2H发动机的安装仅被批准用于多发情况/ Arriel 2C, 2C1, 2C2, 2S1, 2S2, 2E, and 2H installation is approved for multi-engine application only
3. 发动机进气/ Air intake:
 - 直升机进气设计应能防止冰、雪和水的瞬时摄入量超过安装和操作手册中规定的最大值/ The helicopter air intake design shall be such as to prevent instantaneous ingestion of ice, snow and water in excess of maximum quantities defined in the Installation and Operating Manual.
 - 应根据安装和操作手册中的规定设置防护网，以限制发动机吸入异物的大小/ A protective grid as defined in the Installation and Operating Manual shall be installed to limit the ingestion of foreign matters in the engine
4. ARRIEL 2B, 2B1, 2B1A, 2D发动机未被批准装于空客直升机AS 350 B3/EC130(砂滤器P/N 704 A 41 650 010) ， 在结冰条件下运行/ The Arriel 2B, 2B1, 2B1A, 2D are not approved for operation in icing conditions with Airbus Helicopters AS 350 B3 / EC130 sand filter P/N 704 A 41 650 010.
5. 只有ARRIEL 2B1A发动机装配的直升机进气装置参照Z11 MB1-6860-0,进气滤网参照Z11 MB1-6850-30时,才能在结冰条件下(JAR E 780)运行/ The Arriel 2B1A capability to operate in icing conditions (JAR E 780) has been addressed only when fitted with helicopter air intake reference Z11 MB1-6860-0 for the inlet duct and Z11 MB1-6850-30 for the inlet screen.
6. 结冰条件下的运行/ Operation in icing conditions.
 - 6.1 当直升机安装下列进气系统零部件(零件号 (P/N))时, ARRIEL 2E发动机满足规章要求, 可以在结冰条件下运行:/ The Arriel 2E is validated in icing conditions according to engine Airworthiness requirements with the following Aircraft air intake and inlet Part Numbers (P/N):
 - 进气保护外组件LH P/N 117-602351/ Intake protection outer LH assy P/N 117-602351
 - 进气保护内组件RH P/N 117-602401/ Intake protection inside RH assy P/N 117-602401
 - 进气保护内组件LH P/N 117-602371/ Intake protection inside LH assy P/N 117-602371

- 进气保护外组件RH P/N 117-602421/ Intake protection outer RH assy P/N 117-602421
- 进气部件LH P/N D710M1010801/Air inlet LH P/N D710M1010801
- 右侧进风口RH P/N D710M2010801/ Air inlet RH P/N D710M2010801

6.2 如果Arriel 2H安装于一架在已知结冰条件下飞行但未经批准的直升机上, 则根据发动机适航规章要求, 只有当直升机安装下列进气部件(包括防护网)时, 才能对发动机在结冰条件下运行进行验证

The Arriel 2H is assumed to be installed in a helicopter not approved for Flight In Known Icing conditions. The Engine is validated to operate under ice forming conditions according to the engine Airworthiness requirements only with the following helicopter air intake parts (including the protective grid):

进气零件/Air intake parts	零件号/Part numbers
MGB 可拆卸整流罩, 包括进气前端左右两侧/MGB removable cowling, including the forward air intake – left side and right side	Z9-365A24-0110-04
	Z9-365A24-0110-05
进气后端/Backward air intake	Z9-365A54-5022-00
防护网-左右两侧/Protective grid – left side and right side	Z9-365A24-1067-00
	Z9-365A24-1067-01
膨胀密封件/Inflatable sealing	704A39821.013

7. 局部着火事件/ Fire and local events.

7.1 EECU (包括ARRIEL 2D、2E和2H的EDR) 不得安装在可能的火区。安装条件在安装手册中定义/The EECU (as well as the EDR for Arriel 2D, 2Eand 2H) must not be installed in a dedicated fire zone. The installation conditions are defined in the Installation Manual.

7.2 尤其对于Arriel 2H发动机而言/In particular for Arriel 2H:

-不得将EECU和EDR安装在带有飞机部件点火源的易燃液体泄漏区,也不得将其安装在可能导致过热的区域/The EECU and the EDR must not be installed in a flammable fluid leakage zone with an ignition source from aircraft components; nor must they be installed in a zone that might lead to overheat conditions.

-直升机消防切断阀必须安装在受控制系统局部事件影响的区域之外, 这样局部事件就不会同时影响控制系统和消防切断阀。/The helicopter fire shut-off valve must be installed outside of the zone affected by the control system local events so that a local event cannot affect both the control system and the fire shut-off valve at the same time.

-座舱排气切断装置必须安装在受控制系统本地事件影响的区域之外, 以便本地事件不能同时影响控制系统和座舱排气切断装置/The cabin air bleed shut-off device must be installed outside of the zone affected by the control system local events so that a local event cannot affect both the control system and the cabin air bleed shut-off device at the same time.

8. 对于Arriel 2C, 2C1, 2C2, 2S1, 2S2, 2E和2H发动机, 电子控制系统在发动机故障情况下为培

训人员提供“训练”功能。有关此功能的特点, 参见安装手册/For Arriel 2C, 2C1, 2C2, 2S1, 2S2, 2E and 2H, the electronic control system provides a "TRAINING" function for training crews in an engine failure situation. Refer to the Installation Manual for the characteristics of this function.

9. 除Arriel 2D, 2E 外, 其余发动机的EECU软件已通过DO 178 A的level 1验证, Arriel 2D, 2E, 和 2H 发动机的EECU软件已通过DO 178 B的level A 验证/ The software of the EECU has been validated according to DO 178 A, level 1 for all Models except Arriel 2D, 2E and DO 178 B, level A for the Arriel 2D, 2E, and 2H.
10. 安装手册中提供了运行/起动/重新点火的工作范围/ The operating / starting / relight envelope is provided in the Installation Manual.
11. 电磁干扰/闪电 (详细信息参见安装手册) 参照下列标准,相关等级已经经过验证/ EMI / Lightning (Refer to Installation Manual for details) Validated levels have been tested according to the following standards:

	除装有 TU169 的 Arriel 2B1, 2D/, 2E/, 2H 外 其他 / All Models, except: Arriel 2B1 with Modification TU169 (EECU Goodrich EMC101) ; Arriel 2D, /2E, 2H	装有 TU169 的 Arriel 2B1 /Arriel 2B1 with: Modification TU169 (EECU Goodrich EMC101)	Arriel 2D/, 2E/, 2H
感应信号敏感性 /Induced signal susceptibility	DO-160C 第 19 章节 Z 类/DO-160C Section 19, Category Z	DO-160D 第 19 章节 /DO-160D Section 19, Category Z	DO-160E 第 22 章节 ZC 类 /DO-160E Section 19, Category ZC
射 频 敏 感 性 /Radio Frequency susceptibility	DO-160C 第 20.4 章节 Y 类/DO-160C Section 20.4, Category Y ; MIL STD 461C - CS01, CS02, CS06, RS02, RS03	DO-160D 第 20 章节 Y 类 /DO-160D Section 20, Category Y	DO-160E 第 20 章节 G 类(安装操作手册), DO-160E 第 20 章节 Y 类/Conducted : DO-160E, Section 20, Category G extended as per relevant Installation/Operating Manuals Radiated : DO-160E Section 20, Category
射 频 能 量 发 射 /Emission of	DO-160C 第 21 章节 Z 类/DO-160C Section 21,	DO-160D 第 21 章节 H 类	DO-160E 第 21 章节 H 类(安装操作手册)/DO-160E,

Radio Frequency energy	Category Z ; MIL STD 461C - CE01, CE03, CE07, RE02	/DO-160D Section 21, Category H	Section 21, Category H extended as per relevant Installation/Operating Manuals
闪电感应瞬态敏 感性 /Lightning induced Transient susceptibility	DO-160C 第 22 章节 /DO-160C Section 22	DO-160D 第 22 章节 /DO-160D Section 22	DO-160E, Section 22

12. 对于Arriel 2S1和2S2发动机,动力涡轮超转保护装置已安装在所交付的发动机上, 以前该装置仅作备用, 现在作为发动机型号设计的一部分/ For Arriel 2S1 and 2S2, the power turbine overspeed shut-down device, previously available as an option, is now part of the basic Type Design and has been fitted to all the delivered engines

13. EASA批准的持续适航说明中适航限制部分发布在适用的发动机维护手册和大修手册文件第5章“适航限制”中/The EASA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness is published in the applicable Engine Maintenance Manual and Overhaul Manual documents, chapter 5 "Airworthiness Limitations".

14. 限时派遣和派遣构型分析/Time Limited Dispatch and Dispatch Configuration Analysis.

14.1 限时派遣/Time Limited Dispatch

根据CS-E 1030, 未批准发动机进行限时派遣/The engine has not been approved for Time Limited Dispatch in accordance with CS-E 1030

14.2 派遣构型分析/Dispatch Configuration Analysis:

除ARRIEL 2S1、2D、2E以外的所有发动机型号/All Models except Arriel 2S1, 2D, 2E:

飞机起飞前, 所有发动机系统和设备必须正常工作。在飞行中可能发生故障的任何发动机系统或设备应在下一次飞行开始前更换或修理/All engine systems and equipment must be functional prior to aircraft take-off. Any engine system or equipment the failure of which would occur in flight shall be replaced or repaired prior to commencement of next flight.

ARRIEL 2S1:安装手册第15节列出了该涡轮轴发动机设备的发动机制造商派遣建议

Arriel 2S1: Engine manufacturer dispatch recommendations for equipment of Arriel 2S1 turboshaft engine are listed in Installation Manual §15.

Arriel 2D, 2E:已完成发动机派遣构型分析, 参见相关安装手册

Arriel 2D, 2E: Engine Dispatch Configuration analysis have been performed and are referenced in the relevant Installation Manuals.

15. ARRIEL 2S1和ARRIEL 2S2发动机由法国SAFRAN直升机发动机公司组装, 并获得美国

SAFRAN直升机发动机公司（前身为turboca发动机公司）许可。在法国组装的发动机具有符合适用法国法规的标识牌/Arriel 2S1 and Arriel 2S2 engines are assembled by Safran Helicopter Engines in France and under licence by Safran Helicopter Engines USA (formerly Turboméca Engine Corporation) in the USA. Engines assembled in France have an identification plate in accordance with the regulations applicable in France

16. 从非民事使用的转化/Conversion from non-civil use:

本注释适用于以下发动机型号/ This note is applicable to the following variants:

Case 1: Arriel 2B, 2B1, 2C, 2C1, 2C2, 2S1, 2S2发动机最初由赛峰直升机发动机组装，以前用于军队、海关、警方或类似部门，不在民航局方的管辖范围内/ Arriel 2B, 2B1, 2B1A, 2C, 2C1, 2C2, 2S1, 2S2 engines originally assembled by Safran Helicopter Engines and having previously been used by an operator engaged in military, customs, police or similar services, and not under the control of a civil Authority.

Case 2 : Arriel 2CPM发动机是Arriel 2C的军用衍生型，安装在军用直升机上但不限于军用直升机，通过对Arriel 2CPM发动机的改装可以得到Arriel 2C发动机。必须检查这些发动机是否符合欧洲规章，以便颁发飞机标准适航证书。它们的构型（包括设计更改和维修）有可能不符合EASA批准的型号定义，并且在运行中它们可能超过了EASA批准的限制。在向安装了这种发动机的飞机发出适航标准证书之前，;必须为这些发动机颁发EASA Form 1。这需要纳入以下赛峰直升机发动机公司强制性服务公告/ The Arriel 2CPM is a military variant of the Arriel 2C, known to be installed on, but not limited to, a military helicopter. Arriel 2C engines can be created by converting Arriel 2CPM engines. The compliance of such engines with the European rules enabling issuance of an aircraft standard certificate of airworthiness must be checked. Their configuration, including design changes and repairs, does not necessarily conform to the type definition approved by EASA, and it is possible that in operation they have exceeded the limits approved by EASA. Before a standard certificate of airworthiness is issued to an aircraft in which such engines are installed, an EASA Form 1 must be issued for these engines. This requires incorporation of the following Safran Helicopter Engines Mandatory Service Bulletins.

Case 1: A292 72 2817 B 版（或任何后续批准版本）/A292 72 2817 version B (or any subsequent approved issue)

Case 2: A292 72 2819 A 版（或任何后续批准版本）/A292 72 2819 version A (or any subsequent approved issue)

结束

.... END....