

型号认可证数据单
THE VALIDATION DATA SHEET

编号/No: VTC0332A
版次/Revision: 4
型号/Type: MBB-BK117
型别/Model:
MBB-BK117 D-2
MBB-BK117 D-3

批准人/Approved By:



职务/Title: Deputy Director General

日期/date: 2025-01-13

本数据单是型号认可证（编号：VTC0332A）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: VTC0332A), 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:

Airbus Helicopters Deutschland GmbH

INDUSTRIESTRASSE 4 86609 DONAUWOERTH GERMANY

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- II. 型别: MBB-BK117 D-3/ MODEL NUMBER: MBB-BK117 D-3

第1部分 型号认可证概述
SECTION 1 GENERAL OF VTC

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	VTC0332A REV 4 2025-01-13	EASA R.010 EASA R.010 Issue 21 24 November 2023
历史 History	VTC0332A REV 3 2024-10-28	EASA R.010 EASA R.010 Issue 21 24 November 2023
历史 History	VTC0332A REV 2 2024-02-09	EASA R.010 EASA R.010 Issue 20 2 February 2023
历史 History	VTC0332A REV1 2021-11-10 REV 0 2016-11-15	EASA R.010 EASA R.010 Issue 16 6 March 2019 EASA R.010 Issue 08 12 MAY 2015

注：上表中出口国局方型号合格证数据单信息仅供参见/ 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 1	1. 更新了“3号喷气燃料”国家标准（GB6537）。 National Standard of “No.3 Jet Fuel”（GB6537） has been updated 2.引入第二个绞车操作员音频和90天水下定位信标（ULB）。 .Introduction of a second winch operator audio and 90 days Underwater Locator Beacon (ULB) . 3.提高在高海拔和重心（CG）扩展方面的性能。 Performance improvement high altitude and CG extension. 4.增强2分钟单发动机不工作功率。 OEI 2 min rating enhancement. 5.第二类绞车，更新适航性限制章节（ALS）和补充飞行手册FMS，更新 包含绞车关键件管理的新关键件清单。 External Hoist Population 2 without credit, update ALS and FMS， new Part Number with Hoist critical part management. 6.增加符合SPA.HOFO.155的振动健康监测。 Addition of Vibration Health Monitoring for SPA.HOFO.155 conformance.	
Rev 2	增加新型别MBB-BK117 D-3。 The new model MBB-BK117 D-3 is added.	
Rev 3	增加MBB-BK117 D-3 (Helionix SW V10)飞行手册（参见EASA大改批准书 10082539）。 Flight Manual for MBB-BK117 D-3 (Helionix SW V10) introduced (ref. EASA	

	Major Change Approval 10082539).	
Rev 4	更新审定基础以包含针对MBB-BK117 D-2重大更改E-4875(EASA批准书10075385)的适航要求。 Certification basis updated to include airworthiness requirements for significant major change E-4875 (EASA Approval 10075385) on MBB-BK117 D-2.	

2. 认可当局/Validation Authority:

中国民用航空局/CAAC

审定当局/Certifying Authority:

欧洲航空局/EASA

3. 型号合格证Type Certificate Number:

EASA R.010

型号合格证持有人/Type Certificate Holder:

AIRBUS HELICOPTERS DEUTSCHLAND GmbH

Industriestrasse 4

D-86609 Donauwoerth

Germany

型号合格证持有人记录

N/A

Type Certificate Holder Record

4. 进口要求/Import Requirement

为具备在中国运行的资格, 按本型号认可证制造的每架航空器必须具有一份出口适航证, 其上签注有出口国适航当局的审定声明, 即: 本架航空器符合CAAC所批准的型号设计, 并处于可安全运行的状态。

To be considered eligible for operation in China, each aircraft manufactured under this Validation of Type Certificate must be accompanied by a certificate of airworthiness for export endorsed by Export Authority which states (in English language): This aircraft conforms to its CAAC type design and is in a condition for safe operation.

第2部分 型号数据 SECTION 2 TYPE DATA

I. 型别: MBB-BK117 D-2
MODEL: MBB-BK117 D-2

一、产品型别和批准日期/THE PRODUCT MODEL AND APPROVAL DATE

CAAC认可日期 2016-11-15
CAAC Validated Date

1. 型号合格证数据单号 EASA R.010
Type Certificate Data Sheet No.

2. 型号、衍生型或型别 Type / Variant or Model

(a) 型号/Type MBB-BK117
(b) 衍生型或型别 Variant or Model: MBB-BK117 D-2

3. 适航类别 运输类旋翼航空器 A类和B类
Airworthiness Category Transport Rotorcraft, Category A and B

4. 型号合格证持有人 AIRBUS HELICOPTERS DEUTSCHLAND GmbH
Type Certificate Holder: Industriestrasse 4
D-86609 Donauwoerth
Germany

5. 国外适航当局申请日期 27 February 2009
Foreign Authority Application Date:

6. 国外适航当局型号审定日期 16 April 2014
Foreign Authority Type Certification Date:

二、合格审定基础和生产依据 CERTIFICATION BASIS AND PRODUCTION BASIS

CAAC型号认可审定基础 CAAC型号认可审定基础定义如下:

CAAC Validation Certification Basis

- 1 EASA型号合格审定基础。
- 2 CAAC附加技术条件:

(1) 根据CCAR 21.29(5), MBB-BK117 D-2机上所有对旅客进行的提示、警告和通知的文字标记和标牌, 机上所有向旅客或机外营救人员指示应急出口和门的位置以及开启方法的文字标记和标牌, 旅客可能使用的机上所有应急设备的操作、使用说明应当至少有简体中文表述。

(2) 必须评估MBB-BK117 D-2燃油系统以证明在使用3号喷气燃料(符合中华人民共和国国家标准GB 6537)时的性能符合要求。在中国运行前符合要求的证明数据必须提供EASA批准。

CAAC validation basis was defined as follows:

- 1 EASA Certification basis.
- 2 CAAC Additional Technical Conditions:

(1) As per CCAR 21.29(5), all literal markings and placards on MBB-BK117 D-2 used for advising, warning or notifying passengers must be at least in Chinese. All literal markings and placards on MBB-BK117 D-2 used for indicating passengers or outboard rescue personnel of the location of emergency exits and doors and their means of opening must be at least in

Chinese, and all operation instructions of MBB-BK117 D-2 emergency equipment that may be used by passengers must be in Chinese.

(2) The fuel system of MBB-BK117 D-2 must be evaluated to demonstrate the satisfactory performance when using No.3 Jet Fuel (conforming to P.R.C National Standard GB6537). The data demonstrating satisfactory performance must be provide to the EASA for approval before its operation in China.

CAAC型号认可证申请日期

2014-05-19

CAAC Validation of Type Certificate
Application Date

(1). 国外适航当局合格审定基础

Foreign Authority Certification Basis:

a. 适航要求

Airworthiness Requirements:

- 以下条款要求按CS-29修正案2:

CS 29.1	CS 29.81	CS 29.351	CS 29.1359
CS 29.25	CS 29.85	CS 29.602	CS 29.1457
CS 29.59	CS 29.143	CS 29.923	CS 29.1459
CS 29.62	CS 29.173	CS 29.1323	CS 29.1587
CS 29.67	CS 29.175	CS 29.1329	CS 29 Appendix B.V
CS 29.77	CS 29.177	CS 29.1351	CS 29 Appendix B.VII

- FAR 29修正案47:

FAR 29.865 (外挂物)

- FAR 29修正案16:

FAR 29.863 (BK117 C-1未受影响的部分)

FAR 29.917 (BK117 C-1未受影响的部分)

FAR 29.1309 (b), (d), (e) (BK117 C-1未受影响的部分)

- 以上未提及的CS/FAR 29条款要求按1965年2月1日生效的FAR 29加修正案29-1 至29-40。

- CS-29, Amendment 2 for the requirements listed below:

CS 29.1	CS 29.81	CS 29.351	CS 29.1359
CS 29.25	CS 29.85	CS 29.602	CS 29.1457
CS 29.59	CS 29.143	CS 29.923	CS 29.1459
CS 29.62	CS 29.173	CS 29.1323	CS 29.1587
CS 29.67	CS 29.175	CS 29.1329	CS 29 Appendix B.V
CS 29.77	CS 29.177	CS 29.1351	CS 29 Appendix B.VII

- FAR 29 Amendment 47:

FAR 29.865 (External Loads)

- FAR 29 Amendment 16:

FAR 29.863 (for unaffected parts of BK117 C-1)

FAR 29.917 (for unaffected parts of BK117 C-1)

FAR 29.1309 (b), (d), (e) (for unaffected parts of BK117 C-1)

- FAR 29 effective Feb. 1, 1965 plus Amendments 29-1 through 29-40,

for all other requirements that are not listed in CS/FAR 29 requirements above

- 对于实施额外的A类起飞和着陆程序（后向延伸、垂直、直升机甲板）以及相关的OEI培训的重大更改E-4875（EASA批准书10075385），CCAR-29-R2的适用要求如下：

- For the significant major change E-4875 (EASA Approval 10075385) on implementation of additional CAT A take-off and landing procedures (Extended Rearward, Vertical, Helideck) and associated OEI Training, the applicable requirements of CCAR-29-R2 are listed below:

29.27	29.59	29.67	29.85	29.1323	29.1585
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29.45	29.60	29.75	29.87	29.1383	29.1587
29.51	29.61	29.77	29.143	29.1501	
29.53	29.62	29.79	29.1301	29.1581	
29.55	29.64	29.81	29.1309	29.1583	

b. 专用条件

Special Conditions:

- 30分钟扩展功率特性 (CRI E-05)
- 锂电池安装 (CRI F-09)
- HIRF防护: JAA INT/POL/27&29/1, Issue 3 (CRI F-01)
- 不可充电锂电池安装(CRI F-35)
- 30 min Extended Power Rating (CRI E-05)
- Lithium Battery Installations (CRI F-09)
- High-intensity Radiated Fields (HIRF) Protection: JAA INT/POL/27&29/1, Issue 3 (CRI F-01)
- Non-rechargeable Lithium Battery Installations (CRI F-35)

c. 豁免

Exemptions:

-

d. 偏离

Deviations

- FAR 29.631 对驾驶舱窗户(BK117 C-2未受影响的部分)
- FAR 29.1027 对主减(BK117 A-1未受影响的部分)
- FAR 29.631 for Cockpit Windows (for unaffected parts of BK117 C-2)
- FAR 29.1027 for Main Gear Box (for unaffected parts of BK117 A-1)

e. 等效安全

Equivalent Safety Findings:

- FAR 29.807 (a)(4), (应急出口) (CRI D-01 和 CRI D-07)
- FAR 29.1305, FAR 29.1321(e), FAR 29.1351(b)(6) , FAR 29.1435(a)(3), (整机参数的部分时间显示) (CRI F-29)
- FAR 29.1545(b)(4), 29.1549(b), (空速和动力装置参数指示 绿色标示) (CRI G-03)
- FAR 29.1305, 29.1309, 29.1549 (OEI 训练模式) (CRI G-01)
- FAR 29.601, 29.603, 29.605(a), 29.865(a) ,FAR 29.1301 (d)(绞车安装) (CRI D-08)
- FAR 29.1457(a), (c) (CVR, 绞盘操纵时的通讯) (CRI F-10)
- FAR 29.807 (a)(4), (for emergency exit) (CRI D-01 and CRI D-07)
- FAR 29.1305, FAR 29.1321(e), FAR 29.1351(b)(6), FAR 29.1435(a)(3), (for Part Time Display of vehicle parameters) (CRI F-29)
- FAR 29.1545(b)(4), 29.1549(b), (for Airspeed & Powerplant indication green marking) (CRI G-03)
- FAR 29.1305, 29.1309, 29.1549 (for OEI training mode) (CRI G-01)
- FAR 29.601, 29.603, 29.605(a), 29.865(a),FAR 29.1301 (d) (for hoist installation) (CRI D-08)
- FAR 29.1457(a), (c) (for CVR, communication during winch operation) (CRI F-10)

f. 选择符合的要求

Requirements elected to comply

当选用以下构型时, 符合CS29.1465修正案5,
CS 29.1465 Amdt. 5, when configured with:
动态监控采集单元 (DMAU) 件号: D313M4011051 (健康检测系统 HMS, 动态监控采集单元DMAU 软件版次 V2.1 HLX2EIS), 或后续批准的HELIONIX航电Step 2 EIS (航空器管理计算机AMC STEP2 EIS 软件版次V5.0.2, D462C01S0502; 航空器管理计算机AMC STEP2R 软件版次 V5.0.2, D462C03S0502, 多功能显示MFD 软件版次 V5.0.1 D463C01S0501), 或后续批准的;
DMAU P/N: D313M4011051 (HMS DMAU SW V2.1 HLX2EIS), or later approved HELIONIX Step 2 EIS (AMC STEP2 EIS SW V5.0.2,

D462C01S0502; AMC STEP2R SW V5.0.2, D462C03S0502, MFD SW V5.0.1 D463C01S0501), or later approved;
和/或and/or

动态监控采集单元（DMAU） 件号: D313M4015051（健康检测系统 HMS, 动态监控采集单元DMAU 软件版次V3.2 HLX2EIS), 或后续批准的HELIONIX航电Step 2 EIS(航空器管理计算机AMC STEP2 EIS软件版次V5.0.2, D462C01S0502; 航空器管理计算机AMC STEP2R 软件版次 V5.0.2, D462C03S0502, 多功能显示MFD 软件版次 V5.0.1 D463C01S0501), 或后续批准的;
DMAU P/N: D313M4015051 (HMS DMAU SW V3.2 HLX2EIS), or later approved HELIONIX Step 2 EIS (AMC STEP2 EIS SW V5.0.2, D462C01S0502; AMC STEP2R SW V5.0.2, D462C03S0502, MFD SW V5.0.1 D463C01S0501), or later on approved;
和/或and/or

动态监控采集单元（DMAU） 件号: D313M4012051（健康检测系统 HMS, 动态监控采集单元DMAU 软件版次V3.2 HLX MR1), 或后续批准的HELIONIX维护1(航空器管理计算机AMC STEP2 软件版次 V6.0, D462C01S0600; 航空器管理计算机AMC STEP2R 软件版次 V6.0, D462C03S0600 ; 多功能显示 MFD 软件版次 V6.0 , D463C01S0600), 或后续批准的;
DMAU P/N: D313M4012051 (HMS DMAU SW V3.2 HLX MR1), or later on approved HELIONIX Maintenance Release 1 (AMC STEP2 SW V6.0, D462C01S0600; AMC STEP2R SW V6.0, D462C03S0600; MFD SW V6.0, D463C01S0600), or later on approved.

g. 环境标准包括噪声
Environmental Standards including Noise:

ICAO Annex 16, Volume I, Chapter 8 (8.4.1) Amendment 10.

(2) 生产依据
Production Basis

POA No: AHD-DE.21G.0013 制造商AHD (德国)
POA No: AHD-DE.21G.0013 for manufacturer site AHD (Germany)

三、 技术特性和使用限制/TECHNICAL CHARACTERISTICS AND OPERATIONAL LIMITATIONS

1.型号设计定义 Type Design Definition:	TDD D0000M170200 版本B, 2014-04-04 TDD D0000M170200 ISSUE B, 04 April 2014		
2.中文标牌和标识 Chinese Placards and marking	中文标牌和标识包含在图纸TDD D0000M01CHN, Issue. 01或CAAC接受的更新版本中。 Chinese Placards and markings are included in TDD D0000M01CHN, Issue. 01 or later revisions CAAC accepted.		
3.设备 Equipment	适用的适航规章（见审定基础）所要求的基本设备必须安装在航空器上以满足型号合格审定要求。 Basic equipment required by the Airworthiness Specifications (see Certification Basis) shall be installed on the helicopter for Airworthiness Certificate release.		
4. 尺寸 Dimensions	机身/Fuselage	长/ Length 宽/Width 高/Height	6.170 m 1.845 m 3.450 m

主旋翼/Main Rotor 4片桨叶-直径/ 4 blades - Diameter 11.0m
尾桨/Tail Rotor 10片桨叶-直径/ 10 blades - Diameter 1.150m

5.发动机 Engine

2台Turbomeca公司 Arriel 2E 涡轮轴发动机
Turbomeca Arriel 2E Turbo shaft engines
国外适航当局发动机TC证编号 EASA.E.001
Foreign Authority Engine TC EASA.E.001
CAAC型号认可证编号: VTC0190E; 数据单版次: 4
CAAC VTC No. VTC0190E; Revision of VTCDs: 4

6.发动机限制及传动系统扭矩 限制

Installed Engine Limits and
Transmission Torque Limits

	扭矩/Torque Limits %	燃气发生器转 速/Gas generator rpm [%]	动力涡轮转 速/Power turbine rpm %	TOT温度 /Temperature TOT °C
<i>所有发动机工作/All Engine Operation (AEO)</i>				
AEO-TOP (5 min)	2 x 95	100.6	108.3	918
AEO-MCP (无限制的 /unlimited)	2 x 74	89.5	108.3	901
扩展功率特性 /Extended Power Rating (30 min)	2 x 95	100.6	108.3	918
<i>一台发动机不工作/One Engine Inoperative (OEI)</i>				
30秒/30 seconds OEI-TOP	1 x 150	105.7	108.3	1006
2分钟/2 min OEI-TOP	1 x 130 ⁽¹⁾	104.3	108.3	987
OEI-MCP	1 x 100	101.7	108.3	945

- 在AEO状态,允许一个发动机的扭矩分别超过给定的MCP和TOP限值3%,只要两个发动机平均扭矩分别低于74%和 95%.
- 在低于VY+10节速度下,AEO瞬态限制值可达2x104.5%,最大持续时间12秒。
- 在大于V_y+10节速度下,AEO瞬态限制值可达2x79%,最大持续时间12秒。
- (1):当安装FADEC EECU软件TU206 (E-4362更改) 时, 2分钟 OEI-TOP 为1 x 142.8 %。
- In AEO, the torque of one engine is allowed to exceed the given MCP resp. TOP limit value by up to 3% as long as the average torque of both engines is below 74% resp. 95%.
- An AEO transient limit of 2x104.5% is available for unintended use below VY + 10 kts for a maximum duration of 12 sec.
- An AEO transient limit of 2x79% is available for unintended use above V_y + 10 kts for a maximum duration of 12 sec.
- (1): With FADEC EECU software TU206 incorporated (change E-4362) the 2 min OEI-TOP is 1 x 142.8 %.

其它发动机和传动系统扭矩限制: 见EASA 批准的飞行手册。/Other Engine and Transmission Torque Limits: Refer to EASA approved Flight Manual

7燃油 Fuel

参见EASA批准的飞行手册第二部分
Refer to EASA approved Flight Manual, Section 2.
3号喷气燃料。(符合中华人民共和国国家标准GB 6537)

No.3 Jet Fuel. (conforming to P.R.C National Standard GB 6537)

7.1燃油容量
Fuel capacities:

标准燃油箱/Standard Fuel Tank:

总油量/Total fuel: 915.8 l

可用油量/Usable fuel: 903.8 l

8滑油
Oil参见EASA批准的飞行手册第二部分
Refer to EASA approved Flight Manual, Section 2.9 空速限制
Airspeed limits: $V_{NE} = 150$ knots V_{NE} 随高度下降以及及其它速度限制数据参见EASA批准的飞行手册
refer to EASA approved Flight Manual for reduction in V_{NE} with altitude and other speed limitations10. 旋翼转速限制
Rotor Speed Limits:

有动力状态/Power on: 最大/maximum 108.3%
最小/minimum 94%
无动力状态/Power off: 最大/maximum 109%
最小/minimum 80% (至 2000 公斤 /up to 2000kg)
最小/minimum 85% (大于 2000 公斤 /above 2000kg)
瞬时/Transient (见EASA批准的飞行手册/see EASA approved RFM).

11. 最大使用升限及温度
Maximum Operating Altitude and Temperature:

升限/altitude 6095 m (20000 ft)
6095 m (20 000 ft PA 与DA中的小者/PA or DA whichever is less) 对于起飞, 着陆和有地效悬停/for TO, LDG and HIGE

温度/Temperature 见EASA批准的飞行手册/refer to EASA approved RFM

12. 使用限制
Operating Limitations:

在已知非结冰条件下, 昼夜间目视飞行
对仪表飞行和A类运行, 见EASA批准的飞行手册
VFR Day and Night, No flight into known icing condition
For IFR and for Cat A Operation refer to the EASA approved RFM

13.最大重量
Maximum Weights:

3700 kg

14. 重心范围
Centre of Gravity Range:

纵向重心限制/Longitudinal C.G Limits,
最大前向限制/maximum forward limit:
4347 mm 基准点后,2400公斤时/aft of DP at 2400 kg
4379 mm 基准点后,3700公斤时/aft of DP at 3700 kg
最大后向限制/maximum rearward limit:
4700 mm 基准点后 在2000公斤时/aft of DP at 2000 kg
4540 mm 基准点后 在3700公斤时/aft of DP at 3700 kg
横向重心限制/Lateral C.G Limits,
左/右最大偏差/maximum deviation on right / left:
100 mm (至3000公斤/up to 3000 kg)
80 mm (大于3000公斤/above 3000 kg)

15. 测量基准

纵向: 后门框水平测量点前3950mm。

Datum:	横向: 机身中心平面。 Longitudinal: 3950 mm forward of the levelling point in the aft door frame Lateral: fuselage median plane.
16. 水平测量措施 Leveling Means:	见维护手册MBB-BK117 D-2 08章。 refer to Maintenance Manual MBB-BK117 D-2
17. 最小飞行机组 Minimum Flight Crew:	一名单驾驶员 One pilot
18. 最大乘员座位数量 Maximum Passenger Seating Capacity:	9 批准的座椅配置见飞行手册。 Nine Refer to RFM for the approved seat configurations
19. 乘客应急出口 Passenger Emergency Exit:	两个 (客舱两侧各一个)。 two (one on each side of the passengers cabin)
20. 最大行李/货物装载 Maximum Baggage/Cargo Loads:	600 kg/m ²
21. 旋翼桨叶操纵面运动范围 Rotor Blade Control movement:	参见MBB-BK117 D-2维护手册。 For rigging information refer to the Aircraft Maintenance Manual MBB-BK117 D-2.
22. 辅助动力装置和辅助动力装置限制 Auxiliary Power Unit (APU) and APU Limitations:	N/A
23. 寿命件 Life-limited parts:	见EASA批准的主维修手册的04章适航限制章节。 EASA approved Airworthiness Limitation Section Chapter 04 of the Master Servicing Manual.
24. 机轮和轮胎 Wheels and Tyres:	滑撬式起落架 Skid type landing gear

四、 使用和维修技术资料/Operating and Service Instructions

1. 飞行手册 Rotorcraft Flight Manual	BK117 D-2, 由EASA于2014年4月16日首次批准, 包括特殊操作和选装设备的补充资料, 及后续批准的版本。 BK117 D-2, firstly LBA approved on 16 April 2014, including the supplements for Special Operations and Optional Equipment, or subsequent approved issues
2. 维护手册 Maintenance Manual	a. 航空器维护手册/Aircraft Maintenance Manual (AMM) MBB-BK117 D-2 b. 布线图册/Wiring Diagram Manual (WDM) MBB-BK117 D-2 c. 发动机文件见发动机数据单TCDS EASA.E.001/Engine documents as per Engine TCDS EASA.E.001 d. 主维修手册/Master Servicing Manual (MSM) MBB-BK117 D-2
3. 结构修理手册 Structural Repair Manual	结构修理手册(SRM) BK117/Structural Repair Manual (SRM) BK117

4. 重量平衡手册 Weight and Balance Manual	参见飞行手册第6章。 Refer to Flight Manual Section 6.
5. 图解零件目录 Illustrated Parts Catalogue	BK117图解零件目录/Illustrated Parts Catalogue BK117
6. 服务信件和服务通告 Service Letters and Service Bulletins:	安全信息通告, 信息通告, 紧急服务通告, 服务通报维修设计批准表 Safety information notice, Information Notice, Alert Service Bulletin, Service Bulletin Repair Design Approval Sheets.
7. 必备设备 Required Equipment:	见EASA批准的旋翼机飞行手册和相关补充的其他批准强制性的和可选的设备和主最低设备清单。 Refer to EASA Approved Rotorcraft Flight Manual and related supplements for other approved mandatory and optional equipment and Master Minimum Equipment List.

五、注释/NOTES

1. 合格系列号: 20003及以上

Eligible serial numbers: 20003 and upwards

2. 生产商记录: AIRBUS HELICOPTERS DEUTSCHLAND GmbH, Industriestrasse 4, D-86609 Donauwörth.

Record of Manufacturer: AIRBUS HELICOPTERS DEUTSCHLAND GmbH, Industriestrasse 4, D-86609 Donauwörth.

3. 名称: H145 用作MBB-BK117 D-2直升机的销售名称。

Designation: H145 is used as marketing designation for MBB-BK117 D-2 helicopters.

4. 夜视镜运行能力/Night Vision Goggles Operational Capability:

仅当直升机配备了夜视设备并经过当局运行批准, 才允许夜视镜辅助运行, 该运行应符合飞行手册补充部分9.2-11及其相关的飞行手册附录FMA 11-x要求。

已经获得NVIS构型批准的运营人, 可以在系列号AHD NVIS的证明报告中找到包含已批准的与使用夜视镜相关的NVIS照明组件的直升机构型描述。

Night Vision Goggles aided operations are permitted according to Rotorcraft Flight Manual Supplement RFMS 9.2-11 in conjunction with a serial number specific Flight Manual Appendix FMA 11-x, when the rotorcraft is equipped accordingly and a competent authority has granted operational authorisation only. The helicopter configuration containing NVIS lighting components approved for the use with Night Vision Goggles is described in a serial number specific AHD NVIS Substantiation Report for operators having received an approval for their NVIS configuration.

5. 水上迫降/Ditching:

飞行手册9.2-9节所述的应急漂浮系统已经按照FAR29关于水上迫降的要求进行了审定。

如果安装以下设备并按照相关适航要求获得批准, 则直升机可能获得水上迫降许可。

- 救生型应急定位发射机
- 救生筏安装
- 救生用具

The emergency floatation system according to Rotorcraft Flight Manual Supplement 9.2-9 is certified as ditching provision in accordance with FAR29.

The helicopter may be certified for ditching provided the following additional equipment are fitted and approved in accordance with the relevant airworthiness requirements:

- survival type emergency locator transmitter
- life raft installation
- life preserver.

II. 型别: MBB-BK117 D-3
MODEL: MBB-BK117 D-3

一、产品型别和批准日期/THE PRODUCT MODEL AND APPROVAL DATE

CAAC认可日期 2024-02-09
CAAC Validated Date

1. 型号合格证数据单号 EASA R.010
Type Certificate Data Sheet
No.

2. 型号、衍生型或型别
Type / Variant or Model
(a) 型号/Type MBB-BK117
(b) 衍生型或型别 Variant or Model: MBB-BK117 D-3

3. 适航类别 运输类旋翼航空器 A类和B类
Airworthiness Category Transport Rotorcraft, Category A and B

4. 型号合格证持有人 AIRBUS HELICOPTERS DEUTSCHLAND GmbH
Type Certificate Holder: Industriestrasse 4
D-86609 Donauwoerth
Germany

5. 国外适航当局申请日期 2 March 2018
Foreign Authority Application Date:

6. 国外适航当局型号审定日期 19 June 2020
Foreign Authority Type Certification Date:

二、合格审定基础和生产依据 CERTIFICATION BASIS AND PRODUCTION BASIS

CAAC型号认可审定基础 CAAC型号认可审定基础定义如下:

CAAC Validation
Certification Basis

a. 适航要求
Airworthiness Requirements

MBB-BK117 D-3是MBB BK117 D-2的衍生型, 相较于CAAC认可的MBB-BK117 D-2, MBB-BK117 D-3所完成的重大设计更改适用以下CCAR-29-R2适用条款。

Compared with the MBB-BK117 D-2 which CAAC validated, MBB-BK117 D-3 model is a derivative of MBB BK117 D-2 model.

- For Significant Design Change affected areas with respect to MBB-BK117 D-2 should comply with the bellow applicable sections of the CCAR-29-R2 :

29.1	29.2	29.25	29.27	29.29	29.33	29.45	29.49	29.51
29.53	29.55	29.59	29.61	29.62	29.63	29.64	29.65	29.67
29.75	29.77	29.79	29.81	29.83	29.85	29.87	29.141	29.143
29.151	29.161	29.171	29.173	29.175	29.177	29.181	29.231	29.241
29.251	29.301	29.303	29.305	29.307	29.309	29.321	29.337	29.339
29.341	29.351	29.361	29.391	29.395	29.397	29.399	29.427	29.471
29.473	29.501	29.547	29.549	29.561	29.571	29.573	29.601	29.602
29.603	29.605	29.607	29.609	29.610	29.611	29.613	29.619	29.623
29.625	29.629	29.631	29.653	29.659	29.661	29.663	29.671	29.672
29.673	29.681	29.683	29.685	29.691	29.695	29.771	29.773	29.777
29.779	29.861	29.863	29.865	29.901	29.903	29.907	29.917	29.923

29.927 29.931 29.939 29.1011 29.1041 29.1043 29.1091 29.1121
 29.1151 29.1193 29.1301 29.1303 29.1305 29.1307 29.1309 29.1316
 29.1317 29.1321 29.1322 29.1323 29.1325 29.1327 29.1329 29.1351
 29.1353 29.1357 29.1359 29.1381 29.1431 29.1435 29.1457 29.1459
 29.1503 29.1505 29.1509 29.1517 29.1519 29.1527 29.1529 29.1545
 29.1555 29.1581 29.1583 29.1585 29.1587 Appendix A Appendix B

MBB-BK117 D-3的余下区域、系统、部件和设备, 适用MBB-BK117 D-2 CAAC型号认可审查时适用的适航规章相应条款。

For the remaining areas, systems, parts or appliances of MBB-BK117 D-3, can comply with the applicable sections of earlier airworthiness standard, which applicable on the date of CAAC validation of MBB-BK117 D-2.

b. 专用条件
Special Conditions

经评估EASA专用条件CRI, CAAC接受以下专用条件:

- 30分钟扩展功率特性(CRI E-05)
- 可充电锂电池安装(CRI F-09)
- 不可充电锂电池安装(CRI F-35)
- 网络安全(CRI F-40)

After reviewing EASA CRIs issued for SC, CAAC accepted below Special Condition .

- 30 min Extended Power Rating (CRI E-05)
- Rechargeable Lithium Battery Installations (CRI F-09)
- Non-Rechargeable Lithium Battery Installations (CRI F-35)
- Cybersecurity (CRI F-40)

c. 等效安全
Equivalent Safety Findings

经评估EASA等效安全CRI, CAAC接受以下等效安全:

- FAR 29.807 (a)(4), (应急出口)
- FAR 29.1305, FAR 29.1321(e), FAR 29.1351(b)(6) , FAR 29.1435(a)(3), (整机参数的部分时间显示)
- FAR 29.1545(b)(4), 29.1549(b), (空速和动力装置参数指示 绿色标记) (CRI G-03)
- FAR 29.1305, 29.1309, 29.1549 (OEI 训练模式)
- FAR 29.1457(a), (c) (CVR, 绞盘操纵时的通讯)
- CS/FAR 29.1555 (c)(1) (可用燃油容量标记)
- CS 29.1587 (a)(6) (可替代的A类继续起飞和中断着陆程序)

After reviewing EASA CRIs issued for ELOS, CAAC accepted below ELOSs.

- FAR 29.807 (a)(4), (for emergency exit)
- FAR 29.1305, 29.1321 (e), 29.1351 (b)(6), 29.1435 (a)(3), (for part time display of vehicle parameters)
- FAR 29.1545 (b)(4), 29.1549 (b), (for Airspeed & Powerplant indication green marking)
- FAR 29.1305, 29.1309, 29.1549, (for OEI training mode)
- CS 29.1457 (a), (c), (for CVR, communication during winch operation)
- CS/FAR 29.1555 (c)(1) (for usable fuel capacity marking)
- CS 29.1587 (a)(6) (for alternative Category A continued take-off and balked landing procedures)

d. 偏离
Deviations

经评估EASA偏离CRI, CAAC接受以下偏离:

CS 29.865(a), CS 29.1301(d), CS 29.1309(a)(b) 修正案 8 , 对于 COLLINS AEROSPACE “Population 2” 绞车系统安装。

After reviewing EASA CRIs issued for Deviations, CAAC accepted it.

CS 29.865(a), CS 29.1301(d), CS 29.1309(a)(b) Amdt. 8 for COLLINS AEROSPACE ‘Population 2’ Hoist System Installation

e. 环境保护要求

MBB-BK117 D-3是MBB BK117 D-2的衍生型, MBB-BK117 D-3所完成的重

Environmental Protection Requirements	大设计更改适用以下环保要求 - 航空器型号和适航合格审定噪声规定 (CCAR-36-R2) - 涡轮发动机飞机燃油排泄和排气排出物规定 (CCAR-34) MBB-BK117 D-3 model is a derivative of MBB BK117 D-2 model. For Significant Design Change affected areas with respect to MBB-BK117 D-2 should comply with the bellow Environmental Protection Requirements - Noise standards: Aircraft type and airworthiness certification (CCAR-36-R2) - Fuel Venting and exhaust emission requirements for turbine engine powered airplanes (CCAR-34)
f. CAAC附加技术条件 CAAC Additional Technical Conditions	CAAC附加以下技术条件: - ATC 1. 根据CCAR 21.29(5), 有关适航规章、噪声规定所要求的手册、标牌、目录清单和仪表标记应当用中文或者英文书写, 下列各项应当至少有中文表述: 1. 机上所有对旅客进行的提示、警告和通知的文字标记和标牌; 2. 机上所有向旅客或者机外营救人员指示应急出口和门的位置以及开启方法的文字标记和标牌; 3. 旅客可能使用的机上所有应急设备的操作、使用说明。 - ATC 2. 燃料应符合中华人民共和国国家标准 “3号喷气燃料” (GB 6537) 的规定。 CAAC added the following Additional Technical Conditions: - ATC 1. As per CCAR 21.29(5), The manuals, placards, listings and instrument markings required by the applicable airworthiness regulation, noise requirements, are presented in Chinese or English language. Below items must be at least in Chinese language. 1.All literal markings and placards on an aircraft used for indicating, warning and informing passengers 2.All literal markings and placards on an aircraft used for indicating passengers or outboard rescue personnel of the location of doors and their means of opening. 3.The operation and use instructions of emergency equipments which passengers will use. - ATC 2. Fuel conforming to Specification “PRC National Standard No.3 Jet Fuel - GB6537.”
CAAC型号认可证申请日期 CAAC Validation of Type Certificate Application Date	19 April 2022
(1) 国外适航当局合格审定基础 Foreign Authority Certification Basis:	参见数据单EASA.R.010 Issue 21 See TCDS No.: EASA.R.010 Issue 21
(2) 生产依据 Production Basis	POA No: EASA.21G.0070 空客直升机公司 POA No: EASA.21G.0070 Airbus Helicopters

三、技术特性和使用限制/TECHNICAL CHARACTERISTICS AND OPERATIONAL LIMITATIONS

1.型号设计定义 Type Design Definition:	TDD D0000M5053CHN Issue 03
2.中文标牌和标识 Chinese Placards and marking	见TDD D0000M5053CHN Issue 03第6节 Section 6 of TDD D0000M5053CHN Issue 03
3.设备 Equipment	直升机注册前, 基本设备必须完成安装且可用。 Basic equipment must be installed and operational prior to registration of the helicopter.

4. 尺寸 Dimensions	机身/Fuselage	长/ Length	11.69 m
		宽/Width hull	2.73 m
		高/Height	3.98 m
	主旋翼/Main Rotor	5片桨叶-直径/ 5 blades - Diameter	10.80m
	尾桨/Tail Rotor	10片桨叶-直径/ 10 blades - Diameter	1.15m

5. 发动机
Engine

2台Safran公司（前身Turbomeca）Arriel 2E直升机发动机
Safran Helicopter Engines (former: Turbomeca)
2 x Model Arriel 2E
国外适航当局发动机TC证编号 EASA.E.001
Foreign Authority Engine TC EASA.E.001 Issue 12
CAAC型号认可证编号: VTC0190E; 数据单版次: 6
CAAC VTC No. VTC0190E; Revision of VTCDS: 6

6. 发动机限制及传动系统扭矩
限制

Installed Engine Limits and
Transmission Torque Limits

	扭矩 /Torque Limits %	燃气发 生器 (N1)转 速/Gas generator (N1) rpm %	动力涡 轮(N2) 转速 /Power turbine (N2) rpm %	TOT温度 ⁽⁷⁾ /Temperature TOT °C ⁽⁷⁾	TOT温度 ⁽⁸⁾ /Temperature TOT °C ⁽⁸⁾
AEO-MCP	2 x 74 ⁽¹⁾	98.5	108.3	901	916
AEO TOP (30 min)	2 x 95 ⁽¹⁾⁽²⁾	100.6	108.3	918	933
AEO transients	(3)	(4)		(5)	(6)
OEI-MCP	1 x 100	101.7	108.3	945	960
OEI 2 min	1 x 143	104.3	108.3	987	1002
OEI 30 sec	1 x 150	105.7	108.3	1006	1021

- (1)在AEO状态,允许一个发动机的扭矩分别超过给定的MCP和TOP限值3%,只要两个发动机平均扭矩分别低于74%和95%.
- (2)达到V_Y+10kt, 然后在V_Y+25kt及以上线性下降至AEO MCP限值。
- (3)超过TOP/MCP限值9.5%的AEO瞬态可用于长达12秒的非预期使用。使用监控系统将记录超过瞬态限值或使用瞬态范围超过12秒的情况, 并需要进行维护。
- (4) 101.7%的AEO瞬态限值（或作为高度和OAT的函数计算的值）可用于最长20秒的非预期使用。。
- (5)最高945° C的AEO瞬态限值可用于非预期使用, 最长持续时间为20秒。
- (6) 最高960° C的AEO瞬态限值可用于非预期使用, 最长持续时间为20秒。
- (7)未安装FADEC EECU软件TU225 (E-6768更改)
- (8)安装FADEC EECU软件TU225 (E-6768更改)

- (1) In AEO, the torque of one engine is allowed to exceed the given MCP resp. TOP limit value by up to 3% as long as the average torque of both engines is below 74% resp. 95%.
- (2) Up to V_Y+10kt, then linearly reducing down to AEO MCP limit at and above V_Y+25kt.
- (3) An AEO transient up to 9.5% above the TOP/ MCP limit is available for unintended use for up to 12 seconds. Any exceedance of the transient limit or any use of the transient range for longer than 12 seconds will be recorded by the Usage Monitoring System

	and will require maintenance.
	- (4) An AEO transient limit of 101.7% (or the value calculated as a function of altitude and OAT) is available for unintended use for a maximum duration of 20 sec.
	- (5) An AEO transient limit up to 945 °C is available for unintended use for a maximum duration of 20 sec.
	- (6) An AEO transient limit up to 960 °C is available for unintended use for a maximum duration of 20 sec.
	- (7) Without FADEC EECU software TU225 installed (change E-6768)
	- (8) With FADEC EECU software TU225 installed (change E-6768)
7燃油 Fuel	参见经批准的飞行手册第二章 Refer to approved RFM, Section 2 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)
7.1燃油容量 Fuel capacities:	标准燃油箱/Standard Fuel Tank: 燃油箱容量/Fuel tank capacity : 915.8 升/litres 可用燃油量/Usable fuel: 903.8 升/litres
8滑油 Oil	参见经批准的飞行手册第二章和第六章。 Refer to approved RFM, Section 2 and 6 .
9 空速限制 Airspeed limits:	Max V_{NE} Power-on (AEO): 150 KIAS Max V_{NE} Power-on (OEI): 110 KIAS Max V_{NE} Power-off: 90 KIAS 参见经批准的飞行手册, V_{NE} 随总重、高度、温度和NR变化。 Refer to approved RFM for variation of V_{NE} with gross weight, altitude, temperature and NR. 其它空速限制: 参见经批准的飞行手册 Other air speed limitations: refer to approved RFM
10. 旋翼转速限制 Rotor Speed Limits:	有动力状态/Power on : 最大/Maximum 107.5% 最小/Minimum 94% 无动力状态/Power off: 最大/Maximum 109% 最小/Minimum 80% (至2250公斤/up to 2250kg) 最小/Minimum 85% (大于2250公斤/above 2250kg) 瞬时/Transient 参见经批准的飞行手册/Refer to approved RFM
11. 最大使用升限及温度 Maximum Operating Altitude and Temperature:	升限/altitude 6095 m (20000 ft) PA 6095 m (20000 ft) PA 与DA中的小者, 对于起飞、着陆和有地效悬停 6095 m (20000 ft) PA or DA whichever is less for TO, LDG and HIGE 温度/Temperature 参见经批准的飞行手册/refer to approved RFM
12. 使用限制 Operating Limitations:	A类和B类 VFR昼夜 IFR

	非结冰条件 其他使用限制参见经批准的飞行手册 Category A and B VFR Day and Night IFR Non-icing conditions Refer to approved RFM for any other operating limitation
13.最大重量 Maximum Masses:	3800 kg
14. 重心范围 Centre of Gravity Range:	纵向重心限制/Longitudinal C.G Limits 最大前向限制/maximum forward limit: 4347 mm 基准点后, 2400公斤时/aft of DP at 2400 kg 4383 mm 基准点后, 3800公斤时/aft of DP at 3800 kg 最大后向限制/maximum rearward limit: 4700 mm 基准点后, 在2000公斤时/aft of DP at 2000 kg 4550 mm 基准点后, 在3800公斤时/aft of DP at 3800 kg 横向重心限制/Lateral C.G Limits 左/右最大偏差/maximum right / left deviation from B.L.: 100 mm (至3000公斤/up to 3000 kg) 80 mm (大于3000公斤/above 3000 kg)
15. 测量基准 Datum:	纵向: 后门框水平测量点前3950mm。 横向: 机身中心平面。 Longitudinal: the datum plane (STA 0) is located at 3950 mm forward of the levelling point in aft door frame Lateral: fuselage median plane
16. 水平测量措施 Levelling Means:	参见维修手册08章。 Refer to Aircraft Maintenance Manual (AMM), Chapter 08
17. 最小飞行机组 Minimum Flight Crew:	一名驾驶员 (右座) One pilot (right seat)
18.最大乘员座位数量 Maximum Passenger Seating Capacity:	9 经批准的座椅配置参见飞行手册。 Nine Refer to RFM for the approved seat configurations
19. 乘客应急出口 Passenger Emergency Exit:	两个 (客舱两侧各一个)。 two (one on each side of the passengers cabin)
20. 最大行李/货物装载 Maximum Baggage/Cargo Loads:	600 kg/m ²
21. 旋翼桨叶操纵面运动范围 Rotor Blade Control Movement:	参见维修手册。 For rigging information refer to Aircraft Maintenance Manual (AMM)

22. 辅助动力装置和辅助动力装置限制
Auxiliary Power Unit (APU) and APU Limitations:

N/A

23. 寿命件
Life-limited Parts:

见经批准的适航限制章节。
See approved Airworthiness Limitations Section (ALS)

四、使用和维修技术资料/Operating and Service Instructions

1. 飞行手册
Flight Manual

a) BK117 D-3 飞行手册, 包含特殊运行和选装设备的补充资料, 2020年6月19日的首版以及后续EASA批准的修订。
b) BK117 D-3 (Helionix SW V10) 飞行手册, 按照大改E-7033 (2023年8月4日的EASA大改批准书10082539) 包含特殊运行和选装设备的补充资料以及后续EASA批准的修订。

a) BK117 D-3 Flight Manual including the supplements for Special Operations and Optional Equipment, Original Issue dated 19 June 2020, or later EASA-approved revisions.
b) BK117 D-3 (Helionix SW V10), in accordance with Major Change E-7033 (EASA Major Change Approval 10082539, dated 4 August 2023) including the supplements for Special Operations and Optional Equipment, or later EASA-approved revisions.

2. 维修手册
Maintenance Manuals

适航限制章节/Airworthiness Limitations Section (ALS) MBB-BK117 D-3
主维护手册/Master Servicing Manual (MSM) MBB-BK117 D-3
维修手册/Aircraft Maintenance Manual (AMM) MBB-BK117 D-2/D-3
布线图册/Wiring Diagram Manual (WDM) MBB-BK117 D-2/D-3
标准施工手册/Standard Practices Manual (MTC) MBB-BK117
腐蚀和侵蚀控制指南/Corrosion and Erosion Control Guide (CECG) MBB-BK117

发动机文件/Engine documents 见数据单EASA.E.001 / as per TCDS EASA.E.001

3. 结构修理手册
Structural Repair Manual

MBB-BK117

4. 重量平衡手册
Weight and Balance Manual

参见经批准的飞行手册。
Refer to approved RFM

5. 图解零件目录
Illustrated Parts Catalogue (IPC)

MBB-BK117 D-3

6. 服务信件和服务通告
Service Letters and Service Bulletins:

安全信息通告, 信息通告, 紧急服务通告, 服务通告修理设计批准表
Safety information notice, Information Notice, Alert Service Bulletin, Service Bulletin Repair Design Approval Sheets.

7. 必备设备
Required Equipment:

参见EASA批准的旋翼机飞行手册和其他经批准强制性的和可选的设备的相关补充资料以及主最低设备清单。
Refer to EASA Approved Rotorcraft Flight Manual and related supplements for other approved mandatory and optional equipment and Master Minimum Equipment List.

五、注释/NOTES

1. 生产商合格系列号Eligible serial numbers:

1.1 s/n 21001及以后;

s/n 21001 and subsequent;

1.2任何MBB-BK117 D-2通过SB MBB-BK117 D-2-00-003改装为MBB-BK117D-3;

any MBB-BK117 D-2 converted into MBB-BK117 D-3 through SB MBB-BK117 D-2-00-003;

1.3 由空客直升机德国公司制造, 详见文件:

Manufactured by Airbus Helicopters Deutschland GmbH, as detailed in document:

TN_EXG_2022_001_MBB-BK117 Serial Production References

2. 定义Designation:

H145是MBB-BK117 D-3直升机的商业名称。

H145 is used as marketing designation for MBB-BK117 D-3 helicopters.

3. 夜视仪运行能力/Night Vision Goggles Operational Capability:

仅当直升机配备了夜视设备并经过当局运行批准, 才允许夜视仪辅助运行, 该运行应符合飞行手册补充部分9.2-11及其相关的飞行手册附录FMA 11-x要求。

已经获得NVIS构型批准的运营人, 可以在系列号AHD NVIS的证明报告中找到包含已批准的与使用夜视仪相关的NVIS照明组件的直升机构型描述。

Night Vision Goggles aided operations are permitted according to Rotorcraft Flight Manual Supplement RFMS 9.2-11 in conjunction with a serial number specific Flight Manual Appendix FMA 11-x, when the rotorcraft is equipped accordingly, and a Competent Authority has granted operational authorisation only. The helicopter configuration containing NVIS lighting components approved for the use with Night Vision Goggles is described in a serial number specific AHD NVIS Substantiation Report for operators having received an approval for their NVIS configuration.

4. 水上迫降/Ditching:

按照FAR 29.801修正案40, 应急漂浮系统被批准符合水上迫降要求 (参见飞行手册附录9.2-9节)。

为使直升机完全获得水上迫降批准, 必须按照FAR 29.801、29.1411和29.1415安装以下附加设备

-经批准的救生型应急定位发射机,

-经批准的救生筏和生存设备,

-经批准的每个乘员的救生用具。

运营人有责任确保不在水上迫降审定之内的设备满足所有适用的适航和运行要求。

The emergency floatation system is approved as a ditching provision according to FAR 29.801 Amdt. 40 (ref. Rotorcraft Flight Manual Supplement 9.2-9). In order for helicopter to be fully approved for ditching the following additional equipment must be installed in accordance with FAR 29.801, 29.1411 and 29.1415:

- approved survival type emergency locator transmitter,

- approved liferafts along with survival equipment,

- approved life preserver for each occupant.

It is the operator's responsibility to ensure that the equipment not covered under ditching certification meets all applicable airworthiness and operational requirements.

5. 修正案26所涉及的FAR 29.1027从未适用于主变速箱, 实际上是被FAR 29.1011 (b),(e), FAR 29.1019和FAR 29.1021至修正案16所替代。

FAR 29.1027, introduced with Amdt. 26, was never adopted for the Main Gearbox and is actually replaced by FAR 29.1011 (b), (e), FAR 29. 1019 and FAR 29.1021 up to Amdt. 16.

- THE END -