

## 型号认可证数据单

### THE VALIDATION DATA SHEET

编号/No.: VTC0198E

版次/Revision: 8

型号/Type: BR700-710

型别/Model:

BR700-710A1-10

BR700-710A2-20

BR700-710C4-11

BR700-725A1-12

BR700-710D5-21

批准人/Approved By:



职务/Title: Deputy Director General of CAAC-AAD

日期/Date: 2026 年 09 月 30 日

本数据单是型号认可证（编号：VTC0198E）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.: VTC0198E), 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:

Rolls-Royce Deutschland Ltd. & Co. KG

Eschenweg 11, 15827 Blankenfelde-Mahlow, Germany

## 第1部分 概述

## Section 1 GENERAL

## 1. 型号认可证数据单版次信息以及修订记录/ Revision and Change Record of the Validation of Type Certificate Data Sheet

## 数据单版次信息/Revision of the Type Certificate Data Sheet

|               | 中国民用航空局认可数据单号、版次和颁发日期<br>CAAC Validation Data Sheet Number, Revision and issuance date                                                                                                                                                                                                                       | 型号合格证数据单号、版次和颁发日期<br>Type Certificate Data Sheet Number, Revision and issuance date                                                                                                                                                                                                                                                                |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 当前<br>Current | VTC0198E, Revision 8, 2026年9月30日                                                                                                                                                                                                                                                                             | EASA TCDS E.018, Issue 16, October 24, 2023                                                                                                                                                                                                                                                                                                        |
| 历史<br>History | VTC0198E, Revision 7, 2025年10月14日<br>注: 新增BR700-710D5-21型别。<br>Note: Adding the model of BR700-710D5-21.                                                                                                                                                                                                     | 1.BR700-710D5-21 型别数据对应 EASA TCDS E.018, Issue 14, December 05, 2019<br>The data of BR700-710D5-21 corresponds to EASA TCDS E.018, Issue 14, December 05, 2019<br>2.其它型别数据对应 EASA TCDS E.018, Issue 16, October 24, 2023<br>The data of other engine models, except for BR700-710D5-21, corresponds to EASA TCDS E.018, Issue 16, October 24, 2023 |
|               | VTC0198E, Revision 6, 2024年6月4日<br>注: 对BR700-725A1-12发动机的180分钟ETOPS能力未更新。<br>Note: The approval for 180 minute ETOPS operation of BR700-725A1-12 engine has not been updated.                                                                                                                                | EASA TCDS E.018, Issue 16, October 24, 2023                                                                                                                                                                                                                                                                                                        |
|               | VTC0198E, Revision 5, 2023年7月17日<br>注: 对BR700-725A1-12发动机的180分钟ETOPS能力未更新。<br>Note: The approval for 180 minute ETOPS operation of BR700-725A1-12 engine has not been updated.                                                                                                                               | EASA TCDS E.018, Issue 15, November 16, 2022                                                                                                                                                                                                                                                                                                       |
|               | VTC0198E, Revision 4, 2021年12月14日<br>注: 对BR700-725A1-12发动机的180分钟ETOPS能力未更新。<br>Note: The approval for 180 minute ETOPS operation of BR700-725A1-12 engine has not been updated.                                                                                                                              | EASA TCDS E.018, Issue 14, December 05, 2019                                                                                                                                                                                                                                                                                                       |
|               | VTC0198E, Revision 3, 2018年7月4日<br>注: 仅对BR700-725A1-12发动机地面冰冻条件运行温度限制改变进行了更新, 对BR700-725A1-12发动机的180分钟ETOPS能力和BR700-710系列三个型号发动机数据未更新。<br>Note: Only the change of temperature limit for freezing fog operation of BR700-725A1-12 engine has been updated.<br>The approval for 180 minute ETOPS operation of | EASA TCDS E.018, Issue 10, March 29, 2017                                                                                                                                                                                                                                                                                                          |

|  |                                                                                                                                                                                                            |                                              |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
|  | BR700-725A1-12 engine and the BR700-710 series engine data has not been updated.                                                                                                                           |                                              |
|  | VTC0198E, Revision 2, 2016年12月28日<br>注: 仅对BR700-725A1-12发动机数据进行了更新, BR700-710系列三个型号发动机数据未更新。<br>Note: Only BR700-725A1-12 engine data has been updated. BR700-710 series engine data has not been updated. | EASA TCDS E.018, Issue 07, November 15, 2013 |
|  | VTC0198E, Revision 1, 2014年11月3日                                                                                                                                                                           | EASA TCDS E.018, Issue 03, Apr 27, 2011      |
|  | VTC0198E, Revision 0, 2007年12月4日                                                                                                                                                                           | EASA TCDS E.018, Issue 01, July 20, 2006     |

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.

### 认可数据单修订记录/Change Record of the VTCDS

| CAAC 认可数据单版次/<br>CAAC VTCDS Revision | 相对上一版次的修订情况/<br>CAAC VTCDS Change Record                                                                                                                                                                                                                                                                                                  | 备注/Remark |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 版次 8/Revision 8                      | 1. 记录 BR700-710D5-21 型发动机符合 CAEP/11 的 nvPM 排放要求 (大改批准书 10080469) /Record of nvPM emissions compliance with CAEP/11 Standard for engine model BR700-710D5-21 (EASA Major Change Approval 10080469)<br>2. 勘误/Correction of errors                                                                                                           |           |
| 版次 7/Revision 7                      | 1. 新增BR700-710D5-21型别/Adding the model of BR700-710D5-21<br>2. 增加第3部分管理信息。/Add Section 3 ADMINISTRATIVE INFORMATION                                                                                                                                                                                                                       |           |
| 版次 6/Revision 6                      | 1. 记录BR700-725A1-12型发动机技术特征——新的液压泵标准 (大改批准书10081366) 和最新的图纸批准清单DIS 10016 第3版 (大改批准书 10082991) / Recording of BR700-725A1-12 Technical Characteristics – new hydraulic pump standard - Major Change Approval 10081366 and recording of the latest DIS 10016 Issue 03 - Major Change Approval 10082991<br>2. 勘误/Correction of typing errors |           |
| 版次 5/Revision 5                      | 1. 记录BR700-710A2-20、BR700-710C4-11和BR700-725A1-12型发动机符合CAEP/11的nvPM要求/Record of nvPM emissions compliance with CAEP/11 Standard for engine models BR700-710A2-20, BR700-710C4-11 & BR700-725A1-12<br>2. 勘误/ Correction of errors                                                                                                          |           |
| 版次 4/Revision 4                      | 1. 记录CAEP/10排放要求的符合性/Record of compliance with CAEP/10 emissions requirements<br>2. 记录3号喷气燃料国家标准 (GB 6537) 的符合性/ Record of compliance with National Standard of No.3 Jet Fuel (GB 6537)                                                                                                                                                   |           |

2. 类别/Category:

发动机/Engine

3. 认可当局/Validation Authority:

中国民用航空局/CAAC

|                                               |                                                                                                                 |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>审定当局/Certifying Authority:</b>             | 欧盟航空安全局/EASA                                                                                                    |
| <b>4. 型号合格证持有人/Type Certificate Holder:</b>   | Rolls-Royce Deutschland Ltd. & Co. KG<br>Eschenweg 11<br>15827 Blankenfelde-Mahlow,<br>Germany                  |
| <b>5. 双发延程飞行/ETOPS:</b>                       | 不适用/NA                                                                                                          |
| <b>6. CAAC专用要求/CAAC Special Requirements:</b> | 中华人民共和国国家标准“3号喷气燃料”(GB 6537)<br>National Standard of the People's Republic of China<br>“No.3 Jet Fuel”(GB 6537) |

## 第2部分 数据单

## Section 2 DATA SHEET

**I. 概述/General****1. 型号/型别/Type/Models:**

型号/Type: BR700-710

型别/Models:

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
|----------------|----------------|----------------|----------------|----------------|

上述型别发动机在下列使用限制条件下被批准用于多发民用飞机,同时需要符合经批准的动力装置安装要求。

These Models are approved for use on multi-engined civil aircraft at the ratings and within the operating limitations specified below, subject to compliance with the powerplant installation requirements appropriate to approved installations.

**2. 型号合格证持有人/Type Certificate Holder:**

Rolls-Royce Deutschland Ltd. & Co. KG  
Eschenweg 11  
15827 Blankenfelde-Mahlow  
Germany

EASA设计机构批准号/EASA Design Organisation Approval No: EASA. 21J.065

**3. 制造人/Manufacturer:**

罗尔斯-罗伊斯德国公司/Rolls-Royce Deutschland Ltd. & Co. KG  
(前身是罗尔斯-罗伊斯德国公司, 前身是宝马罗尔斯-罗伊斯公司)/(Formerly Rolls-Royce Deutschland GmbH, formerly BMW Rolls-Royce GmbH)

**4. 生产依据/ Production Basis**

德国民航局生产机构批准证书号/LBA Production Organisation Approval Certificate Reference:  
DE.21G.004

**5. 申请日期/Date of Application:**

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
| 1993年2月16日     | 1994年3月23日     | 2001年1月15日     | 2006年3月6日      | 2012年12月12日    |

|                  |               |                 |              |                  |
|------------------|---------------|-----------------|--------------|------------------|
| 16 February 1993 | 23 March 1994 | 15 January 2001 | 6 March 2006 | 12 December 2012 |
|------------------|---------------|-----------------|--------------|------------------|

**6. 审定基准日期/Certification Reference Date:**

BR700-710A1-10, BR700-710A2-20, BR700-710C4-11, BR700-725A1-12为1993年8月31日/31 August 1993  
for BR700-710A1-10, BR700-710A2-20, BR700-710C4-11, BR700-725A1-12  
BR700-710D5-21为2015年2月28日/28 February 2015 for BR700-710D5-21

**7. EASA审定日期/EASA Certification Date:**

|                                           |                                           |                                           |                            |                                |
|-------------------------------------------|-------------------------------------------|-------------------------------------------|----------------------------|--------------------------------|
| BR700-710A1-10<br>(参考注释6/refer to note 6) | BR700-710A2-20<br>(参考注释6/refer to note 6) | BR700-710C4-11<br>(参考注释6/refer to note 6) | BR700-725A1-12             | BR700-710D5-21                 |
| 1996年8月14日<br>14 August 1996              | 1997年1月28日<br>28 January 1997             | 2002年6月24日<br>24 June 2002                | 2009年6月23日<br>23 June 2009 | 2018年2月28日<br>28 February 2018 |

**II. 审定基础/Certification Basis****1.EASA审定基础/EASA Certification Basis****1.1 BR700-710A1-10, BR700-710A2-20, BR700-710C4-11:**

|                |                |                |
|----------------|----------------|----------------|
| BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 |
|----------------|----------------|----------------|

适航标准/Airworthiness Standards:

|                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>JAR-E, 第8次修改</li> <li>E/91/1修正案, 1991年5月27日生效</li> <li>E/93/1修正案, 1993年5月17日生效</li> <li>排放和燃油排泄: 国际民航组织附件16, 第二卷 (1993年7月第2版)</li> </ul> 附加: <ul style="list-style-type: none"> <li>JAR-E, Change 8</li> <li>Amendment E/91/1, effective 27.05.1991</li> <li>Amendment E/93/1, effective 17.05.1993</li> <li>Emissions and Fuel Venting: ICAO Annex 16, Volume II (Second Edition July 1993)</li> </ul> Plus: |                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>无/none</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>JAR-E, 第10次修改, E790 吸雨和吸雹</li> <li>JAR-E, 第10次修改, E40(f) 额定值</li> <li>JAR-E, Change 10, E790 Ingestion of Rain and Hail</li> <li>JAR-E, Change 10, E40(f) Ratings</li> </ul> |

专用条件/Special Conditions:

|                                                                                                          |                                                            |
|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• 吸雹/Ingestion of Hail</li> <li>• 吸雨/Ingestion of Rain</li> </ul> | <ul style="list-style-type: none"> <li>• 无/none</li> </ul> |
|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------|

偏离/Deviations:

|                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• JAR-E890(a)反推时的发动机校准– 豁免</li> <li>• JAR-E890(a) Engine Calibration in Reverse Thrust – Exemption</li> </ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------|

等效安全/Equivalent Safety Findings:

|                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• JAR-E840(a)(2)转子完整性</li> <li>• JAR-E840(a)(2) Rotor Integrity</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------|

**1.2 BR700-725A1-12:**

审定规范/Certification Specifications: CS-E, 初版, 2003年10月24日生效  
CS-E, Initial Issue dated 24 October 2003;  
CS-E的E50和E1030, 第1修正案, 2007年12月10日生效  
E50 and E1030 of CS-E, Amendment 1 dated 10 December 2007

专用条件/Special Conditions: 无/none

偏离/Deviations: 无/none

等效安全/Equivalent Safety Findings: 无/none

**1.3 BR700-710D5-21:**

审定规范/Certification Specifications: 发动机适用CS-E, 第4修正案, 2015年3月12日  
CS-E, Amendment 4 dated 12 March 2015 for the engine;  
反推适用JAR-E, 第8次修改加E/91/1和E/93/1修正案  
JAR-E, change 8 plus Amendments E/91/1 and E/93/1 for the Thrust Reverser

专用条件/Special Conditions: 无/none

偏离/Deviations: 无/none

等效安全/Equivalent Safety Findings: CS-E740(b)(1)持久试验试车谱  
CS-E740(b)(1) Endurance Test Schedule  
CS-E790(a)(1) 吸入大颗粒冰雹  
CS-E790(a)(1) Large Hailstone Ingestion

## 1.4 环境保护/Environmental Protection

### 1.4.1 BR700-710A2-20 and BR700-710C4-11

CS-34 第 4 修正案按照局长决定 2021/011/R（适用于 2021 年 7 月 25 日）实施，适用于 2021 年 1 月 1 日的 ICAO 附件 16 第二卷第 10 修正案于 2021 年 4 月 27 日在欧盟立法中实施。

CS-34 Amendment 4 as implemented by ED Decision 2021/011/R (applicable 25 July 2021), ICAO Annex 16 Volume II, Amendment 10 applicable 1 January 2021 as implemented into EU legislation 27 April 2021.

NO<sub>x</sub> 标准符合 ICAO 附件 16 第二卷第 III 部分，第二章 § 2.3.2 e) 节(CAEP/8)。

NO<sub>x</sub> standard in accordance with ICAO Annex 16 Volume II, Part III, Chapter 2, § 2.3.2 e) (CAEP/8).

非挥发性颗粒物最大质量浓度等级符合上述附件中第 III 部分，第四章，4.2.2.1 节。非挥发性颗粒物质量和数量排放符合上述附件中第 III 部分，第四章，4.2.2.2 a) 1) 和 4.2.2.2 b) 1) 节（CAEP/11 对生产中的发动机标准）。

Maximum nvPM mass concentration levels in compliance with Part III, Chapter 4, paragraph 4.2.2.1. nvPM mass and number emissions in compliance with Part III, Chapter 4, paragraph 4.2.2.2 a) 1) and 4.2.2.2 b) 1) (CAEP/11 In-Production standard ).

### 1.4.2 BR700-725A1-12

CS-34 第 4 修正案按照局长决定 2021/011/R（适用于 2021 年 7 月 25 日）实施，适用于 2021 年 1 月 1 日的 ICAO 附件 16 第二卷第 10 修正案于 2021 年 4 月 27 日在欧盟立法中实施。

CS-34 Amendment 4 as implemented by ED Decision 2021/011/R (applicable 25 July 2021), ICAO Annex 16 Volume II, Amendment 10 applicable 1 January 2021 as implemented into EU legislation 27 April 2021.

NO<sub>x</sub> 标准符合 ICAO 附件 16 第二卷第 III 部分，第二章 § 2.3.2 e) 节(CAEP/8)。

NO<sub>x</sub> standard in accordance with ICAO Annex 16 Volume II, Part III, Chapter 2, § 2.3.2 e) (CAEP/8).

非挥发性颗粒物最大质量浓度等级符合上述附件中第 III 部分，第四章，4.2.2.1 节。非挥发性颗粒物质量和数量排放符合上述附件中第 III 部分，第四章，4.2.2.2 a) 1) 和 4.2.2.2 b) 1) 节（CAEP/11 对生产中的发动机标准）。

Maximum nvPM mass concentration levels in compliance with Part III, Chapter 4, paragraph 4.2.2.1. nvPM mass and number emissions in compliance with Part III, Chapter 4, paragraph 4.2.2.2 a) 1) and 4.2.2.2 b) 1) (CAEP/11 In-Production standard ).

### 1.4.3 BR700-710D5-21

CS-34 第 4 修正案按照局长决定 2021/011/R（适用于 2021 年 7 月 25 日）实施，适用于 2021 年 1 月 1 日的 ICAO 附件 16 第二卷第 10 修正案于 2021 年 4 月 27 日在欧盟立法中实施。

CS-34 Amendment 4 as implemented by ED Decision 2021/011/R (applicable 25 July 2021), ICAO Annex 16 Volume II, Amendment 10 applicable 1 January 2021 as implemented into EU legislation 27 April 2021.

NO<sub>x</sub> 标准符合 ICAO 附件 16 第二卷第 III 部分，第二章 § 2.3.2 e) 节(CAEP/8)。

NO<sub>x</sub> standard in accordance with ICAO Annex 16 Volume II, Part III, Chapter 2, § 2.3.2 e) (CAEP/8).

非挥发性颗粒物最大质量浓度等级符合上述附件中第 III 部分，第四章，4.2.2.1 节。非挥发性颗粒物质量和数量排放符合上述附件中第 III 部分，第四章，4.2.2.2 a) 1) 和 4.2.2.2 b) 1) 节（CAEP/11 对生产中的发动机标准）。

Maximum nvPM mass concentration levels in compliance with Part III, Chapter 4, paragraph 4.2.2.1. nvPM mass and number emissions in compliance with Part III, Chapter 4, paragraph 4.2.2.2 a) 1) and 4.2.2.2 b) 1) (CAEP/11 In-Production standard ).

## 2. CAAC认可审定基础/CAAC Validation Certification Basis

### 2.1 **BR700-710A1-10, BR700-710A2-20, BR700-710C4-11, BR700-725A1-12**

CAAC接受EASA的审定基础为认可审定基础。

CAAC accepts EASA certification basis as validation basis.

### 2.2 **BR700-710D5-21**

适航规章/Airworthiness Regulations: 发动机适用CCAR-33-R2  
CCAR-33-R2 for the engine;  
反推适用CCAR-33  
CCAR-33 for the thrust reverser

环保要求/Environmental Requirements: 非挥发性颗粒物最大质量浓度等级和非挥发性颗粒物质量和数量排放适用CCAR-34-R1  
CCAR-34-R1 for the Maximum nvPM mass concentration levels and nvPM mass and number emissions  
除“非挥发性颗粒物最大质量浓度等级和非挥发性颗粒物质量和数量排放”外，其他适用CCAR-34  
CCAR-34 for the other except for the Maximum nvPM mass concentration levels and nvPM mass and number emissions

专用条件/Special Conditions: 发动机整机最大超限  
Inadvertent use of maximum engine over-speed and maximum exhaust gas over-temperature

偏离/Deviations: 无/none

等效安全/Equivalent Safety Findings: CCAR33.78(a)(1) 吸入大颗粒冰雹  
CCAR33.78 (a)(1) Large Hailstone Ingestion

## III. 技术特征/Technical Characteristics

### 1. 型号设计定义/Type Design Definition:

该发动机型号设计在下面的图纸批准清单（DIS）中定义：

The Engine Type Designs are defined in the following Drawing Introduction Sheets (DIS):

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
|----------------|----------------|----------------|----------------|----------------|

|                                                                                |                                                                                |                                                                                |                                                                                |                                                                                 |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| DIS 10002 第3版<br>或之后批准的版本<br>DIS 10002 Issue 03<br>or later approved<br>issues | DIS 10005 第2版或<br>之后批准的版本<br>DIS 10005 Issue 02<br>or later approved<br>issues | DIS 10012 第1版<br>或之后批准的版本<br>DIS 10012 Issue 01<br>or later approved<br>issues | DIS 10016 第3版或<br>之后批准的版本<br>DIS 10016 Issue 03<br>or later approved<br>issues | DIS 10018 第4版或<br>之后批准的版本<br>DIS 10018, Issue 04<br>or later approved<br>issues |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------|

发动机型号设计更改在经过批准的更改通告中介绍。

Changes to the Engine Type Design are introduced by approved Modification Bulletins.

## 2. 描述/Description:

| BR700-710A1-10                                                                                                                                                                                                                                                                                                                                                                                                                        | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|
| <p>双轴轴流发动机，包括1级风扇，10级轴流高压压气机，环形燃烧室，2级轴流高压涡轮，2/3*级轴流低压涡轮，附件齿轮箱，反推装置**和FADEC。</p> <p>Two spool axial flow engine consisting of a single stage fan, a ten stage axial flow high pressure compressor, an annular combustion chamber, a two stage axial flow high pressure turbine, a two/three* stage axial flow low pressure turbine, an accessory gearbox, a thrust reverser** and a Full Authority Digital Engine Control (FADEC).</p> |                |                |                |                |

\* BR700-710A1-10，BR700-710A2-20和BR700-710C4-11为2级轴流低压涡轮，BR700-725A1-12和BR700-710D5-21为3级轴流低压涡轮。

The BR700-710A1-10, BR700-710A2-20 and BR700-710C4-11 feature a two stage axial flow low pressure turbine, while the BR700-725A1-12 and BR700-710D5-21 features a three stage axial flow low pressure turbine.

\*\* BR700-725A1-12的设计具有反推装置，但不属于发动机型号设计的部分。

The BR700-725A1-12 is designed for use with a Thrust Reverser, but it is not part of the engine Type Design.

## 3. 设备/Equipment:

已批准的设备列在下面RRD报告中/Approved equipment is listed in the following RRD Reports:

| BR700-710A1-10                                                                                                              | BR700-710A2-20                                                                                                              | BR700-710C4-11                                                                                                              | BR700-725A1-12                                                                                  | BR700-710D5-21                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| E-TR150/95-(FR)第3版“发动机设备分类”或之后批准的版本<br>E-TR150/95-(FR), ISSUE 03 ‘Engine Equipment Classification’ or later approved issues | E-TR427/96-(FR)第1版“发动机设备分类”或之后批准的版本<br>E-TR427/96-(FR), ISSUE 01 ‘Engine Equipment Classification’ or later approved issues | E-TR466/01-(FR)第2版“发动机设备分类”或之后批准的版本<br>E-TR466/01-(FR), ISSUE 02 ‘Engine Equipment Classification’ or later approved issues | 见安装手册<br>O-TR1458/08或之后批准的版本<br>See Installation Manual<br>O-TR1458/08 or later approved issues | 见安装手册EDNS<br>01000373100/006或之后批准的版本<br>See Installation Manual EDNS<br>01000373100/006 or later approved issues |

关于发动机型号设计定义所包含的设备细节，参见相应的发动机DIS。

For details of equipment included in the type design definition: refer to the appropriate engine DIS.

#### 4. 尺寸/Dimensions:

|                                           | BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12                                                                             | BR700-710D5-21                                                                   |
|-------------------------------------------|----------------|----------------|----------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| 总长<br>Overall Length                      | 4669 mm        | 4669 mm        | 4660 mm        | 3297mm<br>(整流罩尖到排气锥后部)<br>(tip of spinner to rear of exhaust cone)                         | 4809 mm<br>(整流罩尖到反推后部)<br>(tip of spinner to rear of thrust reverser)            |
| 最大直径<br>(半径)<br>Maximum Diameter (radius) | 1820 mm        | 1820 mm        | 1785 mm        | 950 mm<br>(从中心线到AGB最底端半径)<br>(radius from center line measured at the lowest point of AGB) | 980 mm<br>(从中心线到余油板的半径)<br>(radius from centreline measured to the drains plate) |

#### 5. 干重/Dry Weight:

|                             | BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| 干发动机重量<br>Dry engine Weight | 1851.2 kg      | 1891.0 kg      | 1818.4 kg      | 1635.2 kg      | 1828.8 kg      |

BR700-710A1-10，BR700-710A2-20 和 BR700-710C4-11 发动机干重包括反推装置和附件，BR700-725A1-12发动机干重包括附件，但不包括所有液体及购买者安装的设备，并且BR700-725A1-12发动机不包括反推装置。

Dry weight includes thrust reverser and dressings for the BR700-710A1-10, BR700-710A2-20 and BR700-710C4-11 and dressings for the BR700-725A1-12, but excludes all fluids and all buyer furnished equipment and in the case of the BR700-725A1-12 also the thrust reverser.

#### 6. 额定值/Ratings:

|                | BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 起飞<br>Take off | 65.6 kN        | 65.6 kN        | 68.4 kN        | 75.2 kN        | 67.8 kN        |

|                               |         |         |         |         |         |
|-------------------------------|---------|---------|---------|---------|---------|
| 最大连续<br>Maximum<br>Continuous | 64.3 kN | 64.3 kN | 64.3 kN | 66.6 kN | 63.4 kN |
|-------------------------------|---------|---------|---------|---------|---------|

见注释5/See Note 5.

## 7. 控制系统 / Control System:

发动机安装了全权限数字发动机控制（FADEC）系统。

The engine is equipped with a Full Authority Digital Engine Control (FADEC) system.

|                       | BR700-710A1-10                                                              | BR700-710A2-20                                                              | BR700-710C4-11                                                              | BR700-725A1-12                                                            | BR700-710D5-21                                                                  |
|-----------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| EEC零件编号<br>EEC<br>P/N | 1501KDC01-817<br>或之后批准标准<br>1501KDC01-817<br>or later approved<br>standards | 1520KDC01-605<br>或之后批准标准<br>1520KDC01-605<br>or later approved<br>standards | 1505KDC01-002<br>或之后批准标准<br>1505KDC01-002<br>or later approved<br>standards | G3010ECU01BA<br>或之后批准标准<br>G3010ECU01BA<br>or later approved<br>standards | G3020ECU01AE<br>或之后批准的标准<br>准<br>G3020ECU01AE<br>or later approved<br>standards |

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

经批准的燃油、添加剂和滑油列在使用说明手册中。

Approved fuels, additives and oils are listed in the Operating Instructions.

## 9. 航空器附件驱动装置/Aircraft Accessory Drives:

| BR700-710A1-10<br>(安装了两台液压泵)<br>(with two hydraulic pumps installed) | 旋转方向*<br>Direction of Rotation* | 传动比<br>Transmission Ratio | 剪切扭矩<br>Shear Torque [Nm] | 重量<br>Weight [kg] | 静悬臂梁力矩<br>Static Overhang Moment [Nm] | 最大输出扭矩<br>Maximum Torque Extraction [Nm] |
|----------------------------------------------------------------------|---------------------------------|---------------------------|---------------------------|-------------------|---------------------------------------|------------------------------------------|
| 6号齿轮安装座<br>(1号液压泵)<br>Gear Line 6 Pad<br>(Hydr. Pump 1)              | 逆时针<br>counter-clockwise        | 0.270                     | 418                       | 8.91              | 8.1                                   | 69                                       |
| 8号齿轮安装座<br>(2号液压泵)<br>Gear Line 8 Pad<br>(Hydr. Pump 2)              | 逆时针<br>counter-clockwise        | 0.275                     | 418                       | 8.91              | 8.1                                   | 68                                       |

|                                                      |                  |       |       |       |      |     |
|------------------------------------------------------|------------------|-------|-------|-------|------|-----|
| 11号齿轮安装座<br>(发电机)<br>Gear Line 11 Pad<br>(Generator) | 顺时针<br>clockwise | 0.520 | 412.5 | 32.61 | 56.5 | 106 |
|------------------------------------------------------|------------------|-------|-------|-------|------|-----|

| <b>BR700-710A1-10 &amp;<br/>BR700-710C4-11</b>          | 旋转方向*<br>Direction of<br>Rotation* | 传动比<br>Transmission<br>Ratio | 剪切扭矩<br>Shear Torque<br>[Nm] | 重量<br>Weight<br>[kg] | 静悬臂梁<br>力矩<br>Static<br>Overhang<br>Moment<br>[Nm] | 最大输出<br>扭矩<br>Maximum<br>Torque<br>Extraction<br>[Nm] |
|---------------------------------------------------------|------------------------------------|------------------------------|------------------------------|----------------------|----------------------------------------------------|-------------------------------------------------------|
| 8号齿轮安装座<br>(液压泵)<br>Gear Line 8 Pad<br>(Hydraulic Pump) | 逆时针<br>counter-clockwise           | 0.275                        | 418                          | 8.91                 | 8.1                                                | 86                                                    |
| 11号齿轮安装座<br>(发电机)<br>Gear Line 11 Pad<br>(Generator)    | 顺时针<br>clockwise                   | 0.520                        | 412.5                        | 32.61                | 56.5                                               | 106                                                   |

| <b>BR700-710A2-20</b>                                      | 旋转方向*<br>Direction of<br>Rotation* | 传动比<br>Transmission<br>Ratio | 剪切扭矩<br>Shear Torque<br>[Nm] | 重量<br>Weight<br>[kg] | 静悬臂梁<br>力矩<br>Static<br>Overhang<br>Moment<br>[Nm] | 最大输出<br>扭矩<br>Maximum<br>Torque<br>Extraction<br>[Nm] |
|------------------------------------------------------------|------------------------------------|------------------------------|------------------------------|----------------------|----------------------------------------------------|-------------------------------------------------------|
| 6号齿轮安装座<br>(液压泵)<br>Gear Line 6 Pad<br>(Hydraulic Pump)    | 逆时针<br>counter-clockwise           | 0.335                        | 305.1                        | 6.54                 | 6.1                                                | 39                                                    |
| 8号齿轮安装座<br>(2号发电机)<br>Gear Line 8 Pad<br>(Generator No. 2) | 逆时针<br>counter-clockwise           | 1.080                        | 283                          | 20.3**               | 32.5                                               | 50                                                    |

|                                                             |                  |       |     |        |      |    |
|-------------------------------------------------------------|------------------|-------|-----|--------|------|----|
| 11号齿轮安装座<br>(1号发电机)<br>Gear Line 11 Pad<br>(Generator No.1) | 顺时针<br>clockwise | 1.083 | 283 | 20.3** | 32.5 | 50 |
|-------------------------------------------------------------|------------------|-------|-----|--------|------|----|

| <b>BR700-725A1-12</b>                  | 旋转方向*<br>Direction of<br>Rotation* | 传动比<br>Transmission<br>Ratio | 剪切扭矩<br>Shear<br>Torque<br>[Nm] | 重量<br>Weight<br>[kg] | 连续输出<br>扭矩<br>Contin.<br>Torque<br>[Nm] | 静悬臂梁<br>力矩<br>Static<br>Overhang<br>Moment<br>[Nm] |
|----------------------------------------|------------------------------------|------------------------------|---------------------------------|----------------------|-----------------------------------------|----------------------------------------------------|
| 液压泵和作动器<br>/Hydr. Pump and<br>Actuator | 顺时针<br>clockwise                   | 0.261                        | 406.75                          | 14.82****            | 120***                                  | 16.37                                              |
| 整体驱动发电机/IDG                            | 顺时针<br>clockwise                   | 0.522                        | 412.5                           | 32.61**              | 109***                                  | 56.5                                               |
| 空气涡轮起动机<br>/ATS                        | 顺时针<br>clockwise                   | 0.988                        | 847                             | 9.99**               | 415                                     | 6.76                                               |

\*: 沿着旋转轴正视附件箱方向/Looking normal to pad along shaft.

\*\*：干重/Dry.

\*\*\*: 可接受载荷的进一步细节在安装手册中定义/Further details regarding acceptable loading are defined in the Installation Manual.

\*\*\*\*:湿/Wet.

#### BR700-710D5-21

| 安装座/Pad                               | 旋转方向<br>Direction<br>of Rotation | 与 N2 的齿<br>轮比<br>Gear Ratio<br>to N2 | 最大湿悬臂梁<br>力矩<br>Max wet<br>Overhung<br>Moment<br>[Nm] | 剪切颈剪切<br>值<br>Shear Neck<br>Value [Nm] | 最大扭矩<br>Maximum<br>Torque<br>[Nm] | 干重<br>Weight dry<br>[kg] |
|---------------------------------------|----------------------------------|--------------------------------------|-------------------------------------------------------|----------------------------------------|-----------------------------------|--------------------------|
| 发动机驱动泵<br>/EDP                        | 逆时针<br>CCW                       | 0.2778                               | 9.5                                                   | 305.1                                  | 50.8*                             | 8.48                     |
| 变频发电机<br>/VFG<br>1、4号安装座<br>/Pad 1, 4 | 逆时针<br>CCW                       | 0.8594                               | 22.03                                                 | 293 最高值/<br>highest                    | 50.0*                             | 20.29                    |
| 变频发电机<br>/VFG<br>2、3号安装座              | 顺时针<br>CW                        | 0.8978                               | 22.03                                                 | 293 最高值/<br>highest                    | 50.0*                             | 20.29                    |

|           |  |  |  |  |  |  |
|-----------|--|--|--|--|--|--|
| /Pad 2, 3 |  |  |  |  |  |  |
|-----------|--|--|--|--|--|--|

\*:关于可接受负载的进一步详细信息, 请参考安装手册。/Further details regarding acceptable loading are defined in the Installation Manual.

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

**BR700-710A1-10, BR700-710A2-20, BR700-710C4-11 :**

EPR=P50/P20.

第5级和第8级引气量与核心机进口的流量W26相关。风扇引气量与风扇进口流量W1A相关。

The amounts of bleed extraction from stages 5 and 8, respectively, are related to the core entry mass flow, W26.

The amounts of fan bleed extraction are related to the fan entry mass flow, W1A.

第8级可引气到包括最大连续值在内的工况。

Stage 8 bleed extractions are cleared for operation up to and including Maximum Continuous rating.

| BR700-710A1-10<br>功率范围<br>Power Range | 正常流量 [%]<br>Normal Flow [%] |                |            | 最大流量 [%]<br>Maximum Flow [%] |                |            |
|---------------------------------------|-----------------------------|----------------|------------|------------------------------|----------------|------------|
|                                       | 第5级<br>Stage 5              | 第8级<br>Stage 8 | 风扇级<br>Fan | 第5级<br>Stage 5               | 第8级<br>Stage 8 | 风扇级<br>Fan |
|                                       |                             |                |            |                              |                |            |
| 慢车到1.06 EPR<br>Idle to 1.06 EPR       | —                           | 7.8            | —          | 3.0                          | 12.1           | 0.6        |
| 1.06到1.3 EPR<br>1.06 to 1.3 EPR       | 4.4                         | 4.2            | 0.2        | 8.3                          | 7.9            | 1.6        |
| 超过1.3 EPR<br>Above 1.3 EPR            | 4.3                         | —              | 0.4        | 8.5                          | 8.0            | 1.8        |

| BR700-710A2-20<br>功率范围<br>Power Range | 正常流量 [%]<br>Normal Flow [%] |                |            | 最大流量 [%]<br>Maximum Flow [%] |                |            |
|---------------------------------------|-----------------------------|----------------|------------|------------------------------|----------------|------------|
|                                       | 第5级<br>Stage 5              | 第8级<br>Stage 8 | 风扇级<br>Fan | 第5级<br>Stage 5               | 第8级<br>Stage 8 | 风扇级<br>Fan |
|                                       |                             |                |            |                              |                |            |
| 慢车到1.06 EPR<br>Idle to 1.06 EPR       | —                           | 7.8            | 0.4        | 3.0                          | 12.1           | 0.6        |
| 1.06到1.3 EPR<br>1.06 to 1.3 EPR       | 4.4                         | 4.2            | 0.4        | 8.3                          | 7.9            | 0.9        |

|                            |     |   |     |     |     |     |
|----------------------------|-----|---|-----|-----|-----|-----|
| 超过1.3 EPR<br>Above 1.3 EPR | 4.3 | — | 0.4 | 8.5 | 8.0 | 1.1 |
|----------------------------|-----|---|-----|-----|-----|-----|

| BR700-710C4-11<br>功率范围<br>Power Range | 正常流量 [%]<br>Normal Flow [%] |                |            | 最大流量 [%]<br>Maximum Flow [%] |                |            |
|---------------------------------------|-----------------------------|----------------|------------|------------------------------|----------------|------------|
|                                       | 第5级<br>Stage 5              | 第8级<br>Stage 8 | 风扇级<br>Fan | 第5级<br>Stage 5               | 第8级<br>Stage 8 | 风扇级<br>Fan |
| 慢车到1.06 EPR<br>Idle to 1.06 EPR       | —                           | 7.7            | —          | 3.0                          | 12.0           | 0.6        |
| 1.06到1.3 EPR<br>1.06 to 1.3 EPR       | 4.3                         | 4.1            | 0.2        | 8.2                          | 7.8            | 1.6        |
| 超过1.3 EPR<br>Above 1.3 EPR            | 4.2                         | —              | 0.4        | 8.3                          | 7.8            | 1.8        |

**BR700-725A-12:**

$$NHRT2 = \frac{\text{Mechanical HP Speed [rpm]}}{\sqrt{\text{Engine Inlet Temperature [K]}}} = \frac{NH}{\sqrt{T2}}$$

- 第5级和第8级高压压气机客舱引气用高压压气机进口流量W26百分比表示。  
Stage 5 and stage 8 HP compressor customer bleed is expressed as a percentage of HP compressor entry mass flow W26.
- 风扇级引气用风扇叶尖进口流量W12表示。  
Fan bleed flow is expressed as percentage of the fan tip entry mass flow W12.
- 可接受客舱引气的进一步细节在安装手册中定义。  
Further details regarding acceptable conditions for customer bleed air extractions are defined in the installation Manual

| 高压压气机第5级引气/HP Bleed Stage 5 |       |            |       |
|-----------------------------|-------|------------|-------|
| 正常/Nominal                  |       | 最大/Maximum |       |
| NHRT2                       | % W26 | NHRT2      | % W26 |
| Idle – 675                  | 6.5   | Idle – 700 | 7.7   |
| 675 – 850                   | 10.1  | 700 – 875  | 10.1  |

|           |     |           |     |
|-----------|-----|-----------|-----|
| 850 – MTO | 6.5 | 875 – MTO | 8.6 |
|-----------|-----|-----------|-----|

| 高压压气机第8级引气/HP Bleed Stage 8 |       |            |       |
|-----------------------------|-------|------------|-------|
| 正常/Nominal                  |       | 最大/Maximum |       |
| NHRT2                       | % W26 | NHRT2      | % W26 |
| Idle – 790                  | 13.6  | Idle – 800 | 14.1  |
| 790 – MTO                   | 9.3   | 800 – MTO  | 13.6  |

| 低压压气机（风扇）引气/LP(Fan) Bleed |       |            |       |
|---------------------------|-------|------------|-------|
| 正常/Nominal                |       | 最大/Maximum |       |
| NHRT2                     | % W12 | NHRT2      | % W12 |
| Idle – 700                | 1.4   | Idle – 720 | 1.5   |
| 700 – 775                 | 1.7   | 720 – MTO  | 1.9   |
| 775 – MTO                 | 1.7   |            |       |

**BR700-710D5-21:**

允许的名义引气流量/Allowable Nominal bleed flows

| 引气级数/Bleed Stage     | 单位/Unit | 慢车≤ NHRT2 ≤ 980<br>Idle ≤ NHRT2 ≤ 980 | NHRT2 > 980 |
|----------------------|---------|---------------------------------------|-------------|
| 风扇/Fan               | %W020A  | 0.5                                   | 0.6         |
| 高压压气机第4级/HPC stage 4 | %W026   | 1.6                                   | 5.6         |
| 或/or                 |         |                                       |             |
| 高压压气机第7级/HPC stage 7 | %W026   | 9.9                                   | 9.2         |

允许的最大引气流量/Allowable Maximum bleed flows

| 引气级数/Bleed Stage | 单元/Unit | 慢车≤ NHRT2 ≤ 980<br>Idle ≤ NHRT2 ≤ 980 | NHRT2 > 980 |
|------------------|---------|---------------------------------------|-------------|
| 风扇/Fan           | %W020A  | 0.5                                   | 0.6         |

|                            |       |      |      |
|----------------------------|-------|------|------|
| 高压压气机第 4 级<br>/HPC stage 4 | %W026 | 1.6  | 7.3  |
| 或/or                       |       |      |      |
| 高压压气机第 7 级<br>/HPC stage 7 | %W026 | 11.7 | 10.8 |

高压压气机第 4 级引气在整个 NHRT2 范围内提供 1.6%W026 的恒定百分比。

A constant percentage of 1.6%W026 is supplied by HPC stage 4 bleed across the full NHRT2 range.

对于 NHRT2≤980 的情况,除了高压压气机第 4 级引气提供的 1.6%W026 外,只能提取第 7 级引气至所示水平。

For NHRT2 ≤ 980 only stage 7 bleed can be extracted up to the illustrated levels in addition to the stated 1.6%W026 supplied by HPC stage 4 bleed.

对于 NHRT2>980, 高压压气机第 4 级或第 7 级都可以提取到所示的水平。

For NHRT2 > 980 either HPC stage 4 or stage 7 can be extracted up to the illustrated levels.

从第 4 级引气超过规定的 1.6%W026 时, 不允许同时从第 7 级引气。

Simultaneous extraction of HPC stage 4 beyond the stated 1.6%W026 and stage 7 bleed is not permitted.

$$NHRT2 = \frac{\text{Mechanical HP Speed [rpm]}}{\sqrt{\text{Engine Inlet Temperature [K]}}} = \frac{NH}{\sqrt{T2}}$$

第4级和第7级高压压气机客舱引气表示为高压压缩机入口质量流量W026的百分比。

Stage 4 and stage 7 HP compressor customer bleed is expressed as a percentage of HP compressor entry mass flow W026.

风扇引气流量表示为风扇正面入口总质量流量W020A的百分比。

Fan bleed flow is expressed as percentage of the total fan face entry mass flow W020A.

关于客户引气提取可接受条件的更多详细信息, 请参考安装手册。

Further details regarding acceptable conditions for customer bleed air extractions are defined in the Installation Manual.

#### **IV. 使用限制/Operating Limitations**

##### **1. 温度限制/Temperature Limits:**

燃气温度TGT (修正值) /Gas Temperatures TGT (trimmed):

|                                                  | BR700-710A1-10<br>BR700-710A2-20<br>BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
|--------------------------------------------------|----------------------------------------------------|----------------|----------------|
| 地面起动前最大值/<br>Maximum prior to starting on ground | 150 ℃                                              | 150 ℃          | 150 ℃          |
| 地面起动/<br>Starting on                             | 700 ℃                                              | 700 ℃          | 700 ℃          |

|                                                      |       |       |                                |
|------------------------------------------------------|-------|-------|--------------------------------|
| ground                                               |       |       |                                |
| 飞行中起动/<br>Starting in flight                         | 850 ℃ | 850 ℃ | 850 ℃                          |
| 起飞*<br>/Take-off*                                    | 900 ℃ | 900 ℃ | 890 ℃                          |
| 起飞（瞬态2分钟）/<br>Take-off<br>(transient 2 min.)         | N/A   | N/A   | 900 ℃                          |
| 最大连续<br>Maximum<br>Continuous                        | 860 ℃ | 885 ℃ | 850 ℃                          |
| 最大超温（20秒）<br>Maximum Over<br>temperature<br>(20sec.) | 905 ℃ | 920 ℃ | 915 ℃<br>(见注释7) / (see note 7) |

\*:限制时间为5分钟，一台发动机失效后最多10分钟/Limited to 5 minutes and to maximum 10 minutes after one engine having failed

燃油温度/Fuel Temperatures:

|                                                      | BR700-710A1-10          | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
|------------------------------------------------------|-------------------------|----------------|----------------|----------------|----------------|
| 低压泵进口，<br>最大值/<br>LP Pump<br>Inlet,<br>maximum       | 54 ℃（在海平面/at sea level） |                |                |                |                |
| 低压泵进口，<br>51000英尺*/<br>LP Pump<br>Inlet,<br>51000ft* | 47 ℃                    |                |                |                |                |

|                           |                                                                                                          |
|---------------------------|----------------------------------------------------------------------------------------------------------|
| 最小燃油温度<br>Min. fuel temp. | 起飞包线内为-40 ℃<br>起飞包线外为-45 ℃<br>-40 ℃ within the Take-Off envelope/<br>-45 ℃ outside the Take-Off envelope |
|---------------------------|----------------------------------------------------------------------------------------------------------|

\*: 低于51000英尺高度时的最大发动机进口温度由海平面高度数值和51000英尺高度数值进行线性插值算法得到。

The max. engine fuel inlet temperatures at altitude below 51000ft are derived by linear interpolation between the values given for sea level and 51000ft.

滑油温度/Oil Temperatures:

|                                                    | BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12<br>BR700-710D5-21 |
|----------------------------------------------------|----------------|----------------|----------------|----------------------------------|
| 起动时最小值<br>Minimum for starting                     | -30 ℃          | -40 ℃*         | -30 ℃          | -40 ℃                            |
| 加速到起飞状态最小值<br>Minimum for acceleration to Take-off | 20 ℃           |                |                |                                  |
| 不受限制使用的最大值<br>Maximum for unrestricted use         | 160 ℃          |                |                |                                  |

\*: 当温度低于-30℃时，参考运行手册OI-710-2BR/For temperatures below -30 ℃ see OI-710-2BR Operating Instructions.

## 2. 转速限制/ Speed Limits

低压涡轮转速N1/Low Pressure Turbine N1:

|                          | BR700-710A1-10* | BR700-710A2-20* | BR700-710C4-11* | BR700-725A1-12** | BR700-710D5-21* |
|--------------------------|-----------------|-----------------|-----------------|------------------|-----------------|
| 最大起飞<br>Maximum Take-off | 101.1 %         | 102.1 %         | 101.1 %         | 102.8 %          | 102.1 %         |

|                                                            |         |         |         |         |         |
|------------------------------------------------------------|---------|---------|---------|---------|---------|
| 最大连续<br>Maximum<br>Continuous                              | 101.0 % | 102.1 % | 101.0 % | 102.8 % | 102.1 % |
| 最大超转<br>(20秒)<br>Maximum<br>Overspeed<br>(20 sec.)         | 101.5 % | 102.5 % | 101.5 % | 104.3 % | 103.3 % |
| 反推(最大<br>30秒)<br>Reverse<br>Thrust<br>(maximum<br>30 sec.) | 70.0 %  |         |         | 78.1%   | 70.4 %  |

\*: 100% N1转速等于7431 rpm/100% N1 equals 7431 rpm.

\*\*: 100% N1转速等于7000 rpm/100% N1 equals 7000 rpm.

高压涡轮转速N2 / High Pressure Turbine N2:

|                                                    | BR700-710A1-10<br>* | BR700-710A2-20<br>* | BR700-710C4-11<br>* | BR700-725A1-12<br>* | BR700-710D5-21*<br>* |
|----------------------------------------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| 最大起飞<br>Maximum<br>Take-off                        | 99.6%               |                     |                     | 100.0 %             | 101.6%               |
| 最大连续<br>Maximum<br>Continuous                      | 98.9%               |                     |                     | 98.7 %              | 99.9%                |
| 最大超转<br>(20秒)<br>Maximum<br>Overspeed<br>(20 sec.) | 99.8%               |                     |                     | 101.3 %             | 102.8%               |

\*: 100% N2转速等于15898 rpm/100% N2 equals 15898 rpm.

\*\*: 100% N2转速等于19000 rpm /100% N2 equals 19000 rpm.

### 3. 压力限制/Pressure Limits:

#### 3.1 燃油压力/Fuel Pressure

燃油压力/Fuel Pressures:

|                                                       | BR700-710A1-10 | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
|-------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|
| 低压泵进口<br>允许的最小<br>值<br>Minimum at<br>LP Pump<br>Inlet | 34.5 kPa       |                |                |                |                |

### 3.2 滑油压力/Oil Pressure

滑油压力差/Differential Oil Pressures:

|                                                                    |                                                                                        |                |                |                |                |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|
| 在该范围内<br>飞行的较低<br>限制值<br>Lower limit<br>for flight in<br>the range | BR700-710A1-10                                                                         | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
| 慢车至<br>72.3% N2<br>Idle to<br>72.3% N2                             | 241.2 kPa                                                                              |                |                |                |                |
| 72.3% N2至<br>90% N2<br>72.3% N2 to<br>90% N2                       | 在241.2 kPa到310.3 kPa范围内线性插值<br>Straight line interpolation form 241.2 kPa to 310.3 kPa |                |                |                |                |
| 90% N2以<br>上<br>Above 90%<br>N2                                    | 310.3 kPa                                                                              |                |                |                |                |

|                                                                        |                                                                                        |                |                |                |                |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|
| 在该范围内完<br>成飞行的最小<br>值<br>Minimum to<br>complete flight<br>in the range | BR700-710A1-10                                                                         | BR700-710A2-20 | BR700-710C4-11 | BR700-725A1-12 | BR700-710D5-21 |
| 慢车至72.3%<br>N2<br>Idle to 72.3%<br>N2                                  | 172.3 kPa                                                                              |                |                |                |                |
| 72.3% N2至<br>90% N2<br>72.3% N2 to                                     | 在172.3 kPa到241.2 kPa范围内线性插值<br>Straight line interpolation form 172.3 kPa to 241.2 kPa |                |                |                |                |

|                             |           |
|-----------------------------|-----------|
| 90% N2                      |           |
| 90% N2以上<br>Above 90%<br>N2 | 241.2 kPa |

#### 4. 安装假设/Installation Assumptions:

细节参考安装手册/Refer to Installation Manuals for details.

#### 5. 限时放行/Time Limited Dispatch:

发动机运行时FADEC系统限时放行的相关信息包含在发动机使用手册和时间限制手册中。

Information on engine operation with FADEC system dispatch limitations is contained in the respective Engine Operating Instructions and Time Limits Manuals.

### V. 运行和服务说明/Operating and Service Instructions

| 手册<br>Manuals                       | BR700-710A1-10                                                                      | BR700-710A2-20                                                                      | BR700-710C4-11                                                                            | BR700-725A1-12                                                                       | BR700-710D5-21                                                                                |
|-------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 安装手册<br>Installation<br>Manual      | E-TR206/95第6<br>版或之后经批准<br>的版本<br>E-TR206/95<br>Issue 6 or later<br>approved issues | E-TR364/95第1<br>版或之后经批准<br>的版本<br>E-TR364/95<br>Issue 1 or later<br>approved issues | E-TR240/01(FR)<br>第2版或之后经<br>批准的版本<br>E-TR240/01(FR)<br>ISS02 or later<br>approved issues | O-TR1458/08第2<br>版或之后批准的<br>版本<br>O-TR1458/08<br>Issue 2 or later<br>approved issues | EDNS<br>01000373100/008<br>或之后批准的版本<br>EDNS<br>01000373100/008<br>or later approved<br>issues |
| 使用手册<br>Operating<br>Instructions   | OI-710-1BR                                                                          | OI-710-2BR                                                                          | OI-710-4BR                                                                                | OI-725-7BR                                                                           | OI-710-8BR                                                                                    |
| 持续适航文<br>件<br>ICA                   |                                                                                     |                                                                                     |                                                                                           |                                                                                      |                                                                                               |
| 维护手册<br>Maintenance<br>Manual       | M-710-1BR                                                                           | M-710-2BR                                                                           | M-710-4BR                                                                                 | M-725-7BR                                                                            | M-710-8BR                                                                                     |
| 发动机手册<br>Engine<br>Manual           | E-710-1BR                                                                           | E-710-2BR                                                                           | E-710-4BR                                                                                 | E-725-7BR                                                                            | E-710-8BR                                                                                     |
| 时间限制手<br>册<br>Time Limits<br>Manual | T-710-1BR                                                                           | T-710-2BR                                                                           | T-710-4BR                                                                                 | T-725-7BR                                                                            | T-710-8BR                                                                                     |

|                              |                                                                                            |
|------------------------------|--------------------------------------------------------------------------------------------|
| 服务通告<br>Service<br>Bulletins | 见 Rolls-Royce Deutschland 公司发行的服务通告<br>As issued by Rolls-Royce Deutschland Ltd. & Co. KG. |
|------------------------------|--------------------------------------------------------------------------------------------|

经过72-101466改装的BR700-710C4-11发动机, 参考E-TR0283/06第1版或者以后批准的版本及服务通告。  
For BR700-710C4-11 Engines with Modification 72-101466 incorporated E-TR0283/06 Issue01 or later approved issue and the Service Bulletin SB-BR700-72-101466 apply additionally.

## VI. 注释/Notes

1. 此系列发动机安装了反推装置/The engines are equipped with a thrust reverser:

|                                                                                      | BR700-710A1-10                                                              | BR700-710A2-20                                                              | BR700-710C4-11                                                              | BR700-725A1-12                                                                    | BR700-710D5- 21                                                           |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| 左侧发动机<br>Left hand engine                                                            | P/N04G0001-039<br>或以后批准的标准<br>P/N04G0001-039<br>or later approved standards | P/N07G0001-005<br>或以后批准的标准<br>P/N07G0001-005<br>or later approved standards | P/N25G0001-001<br>或以后批准的标准<br>P/N25G0001-001<br>or later approved standards | P/N<br>RD00103001-1或以后批准的标准<br>P/N<br>RD00103001-1<br>or later approved standards | P/N 29G0001-021或以后批准的标准<br>P/N 29G0001-021 or later approved standards    |
| 右侧发动机<br>Right hand engine                                                           | P/N04G0001-041<br>或以后批准的标准<br>P/N04G0001-041<br>or later approved standards | P/N07G0001-007<br>或以后批准的标准<br>P/N07G0001-007<br>or later approved standards | P/N25G0001-003<br>或以后批准的标准<br>P/N25G0001-003<br>or later approved standards | P/N<br>RD00103001-2或以后批准的标准<br>P/N<br>RD00103001-2<br>or later approved standards | P/N 29G0001-023或以后批准的标准<br>P/N<br>29G0001-023 or later approved standards |
| 反推操作只能在地面进行。<br>Operation of these thrust reversers is approved for ground use only. |                                                                             |                                                                             |                                                                             |                                                                                   |                                                                           |
| 禁止推力反向/Power back is prohibited.                                                     |                                                                             |                                                                             |                                                                             |                                                                                   |                                                                           |

2. EASA批准的持续适航文件中的适航限制章节, 发布在相应的《时间限制手册》中。  
The EASA approved Airworthiness Limitation Section of the Instructions for Continued Airworthiness is published in the applicable Time Limits Manual.
3. EEC软件的开发与验证依据RTCA/DO-178B和ED-12B, Level A。  
The EEC software has been developed and verified in accordance with RTCA/DO-178B respectively ED-12B, Level A.
4. 有关闪电防护和电磁兼容的信息包含在安装手册中。  
Information on lightning protection and electromagnetic compatibility is contained in the Installation Manuals.

5. III.6.中所示的额定值是在包含进气和排气系统的确定构型试验台的如下试验条件下进行的：日间海平面标准大气条件，所有可选的引气都关闭，所有飞机服务设备未加载，使用43179 kJ/kg [22721 CHU/kg]低燃油热值。起飞额定值和相关使用限制在一台发动机失效或停车时最多使用10分钟。

The ratings shown under III.6. are achieved at sea level and ISA standard day conditions using a defined test bed configuration for the air intake and exhaust system with all optional bleeds closed and the aircraft service equipment drives unloaded, at a lower fuel heating value of 43179 kJ/kg [22721 CHU/kg]. The take-off rating and associated operating limitations may be used for up to 10 minutes in the event of an engine failure or shut down.

6. BR700-710A1-10, BR700-710A2-20, BR700-710C4-11发动机之前已经过德国民航局（LBA）的型号合格审查，其型号合格证和型号合格证数据单的编号为6305 (BR700-710A1-10: 第7版, BR700-710A2-20: 第6版, BR700-710C4-11: 第1版), 以上文件已被EASA 的型号合格证和型号合格证数据单替代。

Models BR700-710A1-10, BR700-710A2-20, BR700-710C4-11 were previously covered under LBA Engine Type Certificate 6305 and Type Certificate Data Sheets 6305 (BR700-710A1-10 at Issue 7, BR700-710A2-20 at Issue 6, BR700-710C4-11 at Issue 1) prior to being superseded by the EASA Type Certificate and Type Certificate Data Sheet.

7. BR700-725A1-12发动机被批准在非故意使用时的最大排气温度为920℃，BR700-710D5-21发动机被批准在非故意使用时的最大排气温度为915℃，最长时间不超过20秒时可不需要维护。超温的原因应进行调查和记录。

The BR700-725A1-12 engine is approved for a maximum exhaust gas over temperature of 920 °C, BR700-710D5-21 engine 915 °C for inadvertent use for periods up to 20 seconds without requiring maintenance action. The cause of the over temperature must be investigated and recorded.

8. BR700-725A1-12发动机被批准在冻雾条件下地面运行至-20℃地面冰冻条件下运行，BR700-710D5-21发动机被批准在冻雾条件下地面运行至-19℃地面冰冻条件下运行。

The BR700-725A1-12 engine is approved for ground operation in freezing fog conditions down to minus 20 °C, BR700-710D5-21 down to minus 19 °C.

9. BR700-710D5-21型发动机的市场名为珍珠15。

“Pearl 15” is the marketing name for the BR700-710D5-21 engine model.

### 第3部分 管理信息

#### Section 3 ADMINISTRATIVE INFORMATION

##### 1. 型号认可证持有人记录/ Validation of Type Certificate Holder Record

| 序号<br>/No. | 时间/Time                        | 持证人名称/Name of Validation of Type Certificate Holder |
|------------|--------------------------------|-----------------------------------------------------|
| 1          | 2007年12月4日<br>December 4, 2007 | 罗尔斯-罗伊斯德国公司/Rolls-Royce Deutschland Ltd. & Co. KG   |

--结束--

-- END--