Civil Aviation Authority
United Kingdom

TYPE-CERTIFICATE DATA SHEET

UK.TC.E.00082

for

BR700-730 engines

Type Certificate Holder

Rolls-Royce Deutschland Ltd & Co KG

Eschenweg 11

15827 Blankenfelde-Mahlow

Germany

Model(s):	BR700-730B2-14
Issue:	01
Date of issue:	25 January 2024

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Section 1 General (All Models)

I. General

This Type-Certificate Data Sheet (TCDS) is the concise definition of the type-certificated product accepted and or approved by the CAA in the UK where EASA were the Type Certificating Authority.

Section 2 BR700-730B2-14

I. General

1. Type / Variant or Model

Type: BR700-730

Models:

BR700-730B2-14

This model is approved for use on multi-engine 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. Type Certificate Holder

Rolls-Royce Deutschland Ltd & Co KG

Eschenweg 11

15827 Blankenfelde-Mahlow Germany

DOA ref.: EASA.21J.065

3. Manufacturer

Rolls-Royce Deutschland Ltd & Co KG

4. Date of Application at EASA (Certificating Authority)

Model	Application Date
BR700-730B2-14	27 April 2016

5. Type Certification date at EASA (Certificating Authority)

Model	Certification Date
BR700-730B2-14	14 September 2022

6. Date of Application at CAA (Validating Authority)

Model	Application Date
BR700-730B2-14	08 March 2023

7. Type Certification date at CAA (Validating Authority)

Model	Certification Date
BR700-730B2-14	25 January 2024

II. Certification Basis

1. Reference Date for determining the applicable airworthiness requirements.

30 June 2020

2. State of Design Airworthiness Authority Type Certification Data Sheet Number

EASA.E.135

3. State of Design Airworthiness Authority Certification Basis

Refer to TCDS EASA.E.135

4. UK CAA Certification Basis

4.1 Airworthiness Standards

Model	Airworthiness Standards
BR700-730B2-14	CS-E Amendment 5, effective, 13 December 2018

4.2 Special Conditions (SC)

Model	Special Conditions (SC)
BR700-730B2-14	None

4.3 Equivalent Safety Findings (ESF)

Model	Equivalent Safety Finding (ESF)
BR700-730B2-14	CS-E 740- Endurance Test Blocking CS-E 790- Ingestion of Large Hailstones Compliance CS-E 840 & CS-E 850- HP Shaft Rotor Integrity

4.4 Deviations

Model	Deviations
BR700-730B2-14	None

4.5 Environmental Protection

Model	Environmental Protection requirements.
BR700-730B2-14	CS-34 Amendment 4 as adopted by CAA ORS9 Decision No.36 (applicable from 20 December 2023), meeting the requirement of ICAO Annex 16 Volume II, Amendment 10 applicable 1 January 2021. NOx standard in accordance with ICAO Annex 16 Volume II, Part III, Chapter 2, § 2.3.2 e) (CAEP/8). 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.

III. Technical Characteristics

1. Type Design Definition

The build standards are defined in the following Drawing Introduction Sheet (DIS) or later approved issues:

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

Model	Part Number
BR700-730B2-14	DIS 10022 ISSUE 01 Revision Y plus Modifications provided in Chapter 3 of EDNS01001075067/002-Iss02, or later approved issues

2. Description

The BR700-730B2-14 engine is a 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 four stage axial flow low pressure turbine, an accessory gearbox and a Full Authority Digital Engine Control (FADEC). The engine is designed for use of a thrust reverser (see note 4) but the thrust reverser is not part of the engine type design.

3. Equipment

The engine starter and starter air valve are part of the engine type design. For details of equipment included in the Type Design definition refer to the Engine Drawing Introduction Sheet. The thrust Reverser Unit is not part of the engine type design.

For details of equipment supplied by the Airframe TC holder refer to the Engine Installation Requirements Document.

4. Dimensions

Overall length	3268 millimetres (from tip of spinner to rear of exhaust cone)
Maximum radius	988 millimetres (from centre line measured to lowest point of AGB)

5. Dry Weight

Dry Engine Weight – kg	1617.1

Dry weight includes all engine dressings but excludes all fluids, EBU, nacelle and buyer furnished equipment.

6. Ratings

Models	Maximum Take Off (MTO) kN	Maximum Continuous (MCT) kN
BR700-730B2-14	81.2	72.2

Refer to Notes 1.

7. Control System

The engine is equipped with a Full Authority Digital Engine Control (FADEC) system. Refer to the Engine Installation Requirement Document and Operating Instructions for further information.

EEC, part number	T3030ECU02 or later approved standard
Software Part Number	RRY57FLC0A04002 or later approved standards.

8. Fluids (Fuel, Oil Coolant, Additives)

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

9. Aircraft Accessory Drives

BR700-730B2-14	Direction of Rotation (1)	Gear Ratio to HP Rotor [-]	Static Overhang Moment [Nm]	Shear Neck Value [Nm]	Continuous Torque Extraction (2) [Nm]
Hydraulic Pump	Clockwise	0.261	16.37	406.75	120
IDG (Generator)	Clockwise	0.522	56.5	412.5	100

(1) The direction of rotation is given facing the appropriate gearbox drive pad.
(2) Further details regarding acceptable loading are defined in the installation Requirements Document.

10. Maximum Permissible Air Bleed Extraction

Allowable Nominal Bleed flows:

Bleed Stage	Unit	Flow
Fan	kg/s	4.40
HPC stage 4	kg/s	1.54
HPC stage 7	kg/s	1.41

Allowable Maximum Bleed flows:

Bleed Stage	Unit	Flow
Fan	kg/s	4.45
HPC stage 4	kg/s	2.27
HPC stage 7	kg/s	2.36

Further details regarding acceptable conditions for customer bleed air extraction are defined in the Engine Installation Requirement Document.

IV. Operating Limitations

1. Temperature Limits

1.1. Climatic Operating Envelope

The engine may be used in ambient temperatures up to ISA+40°C. Refer to the applicable engine Installation Manual for details of the Operating Envelope.

1.2. Turbine Gas Temperature (TGT) - Trimmed

Maximum TGT (°C) -BR700 -730B2-14	
Maximum prior to starting on the ground	120
Starting on ground	800
Starting in flight	850
Maximum Take-off (1)	940
Take-off (transient 2 min.)	950
Maximum Continuous	940
Maximum Overtemperature (20 sec) (2)	960

(1) The take-off rating and the associated operating limitations may be used for up to 10 minutes in the event of an engine failure or shut own, but their use is otherwise limited to no more than 5 minutes. If the TGT exceeds 940 Degree Celsius the transient time limit of 2 minutes becomes active.

(2) The BR700-730B2-14 is approved for a maximum turbine gas over temperature of 960 Degree Celsius for inadvertent use for periods of up to 20 seconds without requiring maintenance action. The cause of the over temperature must be investigated and corrected.

1.3. Fuel Temperature

Fuel Temperature (°C)	
LP Pump Inlet, minimum	minus 40
LP Pump Inlet, maximum (1) at Sea-Level	54
LP Pump Inlet, maximum (1) at 15545m (51,000ft)	47

(1) The maximum engine fuel inlet temperature at altitude below 51000ft are derived by linear interpolation between the values given for sea level and 51000ft.

Refer to the Engine Installation Requirements Document for additional information.

1.4. Oil Temperature

Combined Oil Scavenge Temperature (°C)	
Minimum for engine starting	minus 36
Minimum for acceleration to Take Off	20
Maximum for unrestricted use Steady State	170
Maximum for unrestricted use Transient	175

1.5. Equipment Temperatures

Refer to the Engine Installation Requirements Document (EDNS01000951368/002 – Issue002 or later approved issues) for details.

2. Pressure Limits

1.1. Fuel Pressure

Fuel Pressure – kPa (psia)	
Minimum fuel pressure at the low pressure fuel pump inlet: -2 kft: true vapour pressure + 16 psia (true vapour pressure +110.3 kPa)	
Sea Level: true vapour pressure	103.4 (15)
10,000 ft: true vapour pressure	68.9 (10)
51,000 ft: true vapour pressure	34.5 (5)

The minimum fuel pressure at the low pressure fuel pump inlet between stated altitudes are derived by liner interpolation between the values given for adjacent stated altitudes.

1.2. Oil Pressure (Differential Oil Pressure)

Minimum to Start Flight:

Oil Pressure	
Idle to 72.3% NH	241.2 kPa (35 psid)
72.5% NH to 90% NH	Straight Line Interpolation from 241.2 kPa (35 psid) to 310.3 kPa (45 psid)
Above 90% NH	310.3 kPa (45 psid)

Minimum to Complete Flight:

Oil Pressure	
Idle to 72.3% NH	172.3 kPa (25 psid)
72.5% NH to 90% NH	Straight Line Interpolation from 172.3 kPa (25 psid) to 241.2 kPa (35 psid)
Above 90% NH	241.2 kPa (35 psid)

3. Rotational Speed Limits.

Maximum Permissible Rotor Speeds (rpm)	**LP Rotor N1 (NL)**	**HP Rotor N2 (NH)**
Reference speeds	6500 (100%)	19000 (100%)
Maximum for Take-off	6276 (96.6%)	19423 (102.2%)
Maximum Over-speed (20-second limit)	6358 (97.8%)	19646 (103.4%)
Maximum Continuous	6276(96.6%)	19423 (102.2%)
Reverse Thrust (maximum 30 sec.)	4752 (73.1%)	Not Applicable

4. Installation Assumptions

Refer to Installation Requirements Document (EDNS01000951368/008-Issue008 or later approved issues) for details.

5. Time Limited Dispatch

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

V. Operating and Service Instructions

Manuals	**BR700-710B2-14**
Engine Installation Requirements Document	EDNS01000951368/008-Iss008 or later approved issues
Operating Instructions	OI-730-9BR
Instructions for Continued Airworthiness (ICA)	**BR700-710B2-14**
Engine Manual	E-730-9BR
Time Limits Manual	T-730-9BR
Maintenance Manual	M-730-9BR
Service Bulletins	SB-BR700-XX-XXXXXX As issued by Rolls-Royce Deutschland Ltd. & Co. KG.

VI. Notes

1. The take-off rating and the associated operating limitations may be used for up to 10 minutes in the event of an engine failure or shut down, but their use is otherwise limited to no more than 5 minutes. If the TGT exceeds 940 °C the transient time limit of 2 minutes becomes active.

2. The BR700-730B2-14 is approved for a maximum turbine gas over temperature of 960 °C for inadvertent use for periods of up to 20 seconds without requiring maintenance action. The cause of the over temperature must be investigated and corrected.

3. The fuel temperature limits are quoted at the Low Pressure (LP) Pump inlet conditions.

4. The engines are equipped with a thrust reverser (which is not part of the engine design) with the following part numbers:

Left hand engine	BNL4000-53-0
Right hand engine	BNL6000-53-0
Operation of these thrust reversers is approved for ground use only. Power back is prohibited.	

5. The EASA approved Airworthiness Limitation Section of the Instructions for Continued Airworthiness is published in the applicable Time Limits Manual.

6. The EEC software has been developed and verified in accordance with RTCA/DO-178C respectively ED-12C, Level A, with development assurance carried out in accordance with ED79A/ARP4754A.

7. Information on lightning protection and electromagnetic compatibility is contained in the Installation Requirements Document.

8. The BR700-730B2-14 engine is approved for ground operation in freezing fog conditions down to minus 20°C.

9. “Pearl 700” is the marketing name for the BR700-730B2-14 engine model.

Section 3 Administration

I. Acronyms and Abbreviations

Acronym / Abbreviation	Definition
ARINC	Aeronautical Radio, Incorporated
AGB	Accessories Gearbox
CNA	Common Nozzle Assembly
DIS	Drawing Introduction Sheet
EASA	European Union Aviation Safety Agency
ESF	Equivalent Safety Finding
EBU	Engine Build Unit
EEC	Engine Electronic Controller
EMI	Electro Magnetic Interference
FADEC	Full Authority Digital Engine Control
HP	High Pressure
ICAO	International Civil Aviation Organisation
IDG	Integrated Drive Generator
IP	Intermediate Pressure
LP	Low Pressure
rpm	Revolutions per Minute
SC	Special Conditions
TCDS	Type Certificate Data Sheet
TC	Type Certificate
TGT	Turbine Gas Temperature
CAA	Civil Aviation Authority

II. Type Certificate Holder Record

TCH Record	Period
Rolls-Royce Deutschland Ltd & Co KG Eschenweg 11, 15827 Blankenfelde-Mahlow Germany Design Organisation Approval No.: EASA.21J.065	Since initial issue

III. Amendment Record

TCDS Issue No.	TCDS Issue Date	Changes	TC Issue and Date
01	25 Jan 2024	- Initial Issue.	Issue 01 25 Jan 2024

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