



TYPE-CERTIFICATE DATA SHEET

EASA.E.135

for
BR700-730 engines

Type Certificate Holder

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

For Model:

BR700-730B2-14



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I. General

1. Type/ 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

EASA Design Organisation Approval No: EASA.21J.065

3. Manufacturer

Rolls-Royce Deutschland Ltd. & Co. KG

4. Date of Application

BR700-730B2-14
27 th April 2016

5. Certification Reference Date

BR700-730B2-14
30 th June 2020

6. EASA Type Certification Date

BR700-730B2-14
14 th September 2022



II. Certification Basis

1. EASA Certification Basis

1.1. Airworthiness Standards

CS-E amendment 5, effective 13 December 2018.

1.2. Special Conditions (SC)

None

1.3. Equivalent Safety Findings

CS-E 740 – Endurance Test Blocking

CS-E 790 – Ingestion of Large Hailstones Compliance

CS-E 840 & CS-E 850 – HP Shaft and Rotor Integrity

1.4. Deviations

None

1.5. Environmental Protection

CS-34 amendment 4 in accordance with environmental protection requirements, ICAO Annex 16
Volume II (Fourth Edition, Amendment 10)



III. Technical Characteristics

1. Type Design Definition

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

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

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

2. Description

BR700-730B2-14
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

BR700-730B2-14	
Overall Length	3268 mm (tip of spinner to rear of exhaust cone)
Maximum Radius	988 mm (radius from centre line measured to lowest point of AGB)

5. Dry Weight

BR700-730B2-14
1617.1 kg

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

6. Ratings

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

Refer to Note 1.



7. Control System

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

BR700-730B2-14	
EEC Part Number	T3030ECU02 or later approved standards
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:

BR700-730B2-14

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:

BR700-730B2-14

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 extractions are defined in the Engine Installation Requirements 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 Engine Installation Requirements Document for details of the Operating Envelope.

1.2. Turbine Gas Temperature (TGT)

Gas Temperature TGT (trimmed):

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

¹The 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.

²The 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.

1.3. Fuel Temperature

Fuel Temperature:

	BR700-730B2-14	
LP Pump Inlet, minimum		-40 °C
LP Pump Inlet, maximum ¹	At Sea-Level	+54 °C
	15545m (51,000ft)	+47 °C

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:

		BR700-730B2-14	
Minimum for engine starting		-36 °C	
Minimum for acceleration to Take Off		+20 °C	
Maximum for unrestricted use	Steady State	+170 °C	
	Transient	+175 °C	

1.5. Equipment Temperatures

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

2. Rotational Speed Limits

Low Pressure Rotor N1 (NL):

		BR700-730B2-14	
Maximum Take-off ¹		6276 rpm; 96.6%	
Maximum Continuous		6276 rpm; 96.6%	
Maximum Overspeed (maximum 20 sec.)		6358 rpm; 97.8 %	
Reverse Thrust (maximum 30 sec.)		4752 rpm; 73.1 %	

¹100% N1 (NL) is defined as 6500 rpm

High Pressure Rotor N2 (NH):

		BR700-730B2-14	
Maximum Take-off ²		19423 rpm; 102.2%	
Maximum Continuous		19423 rpm; 102.2%	
Maximum Overspeed (maximum 20 sec.)		19646 rpm; 103.4 %	

²100% N2 (NH) is defined as 19000 rpm



3. Pressure Limits

3.1. Fuel Pressure

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 + 15 psia (true vapour pressure + 103.4 kPa)
10 kft: true vapour pressure + 10 psia (true vapour pressure + 68.9 kPa)
51 kft: true vapour pressure + 5 psia (true vapour pressure + 34.5 kPa)

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

3.2. Oil Pressure (Differential Oil Pressure)

Minimum to Start Flight

Idle to 72.3 % NH	241.2 kPa (35 psid)
72.3 % 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

Idle to 72.3 % NH	172.3 kPa (25 psid)
72.3 % 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)

4. Installation Assumptions:

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

5. Time Limited Dispatch:

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



V. Operating and Service Instructions

Manuals	BR700-730B2-14
Engine Installation Requirements Document	EDNS01000951368/008-Iss008 or later approved issues
Operating Instructions	OI-730-9BR

Instructions for Continued Airworthiness (ICA)	BR700-730B2-14
Maintenance Manual	M-730-9BR
Engine Manual	E-730-9BR
Time Limits Manual	T-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 for conditions at the Low Pressure (LP) Pump inlet.
4. The engines are equipped with a thrust reverser (which is not part of the engine design) with the following part numbers:

	BR700-730B2-14	
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 <u>prohibited</u> .		

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. [Reserved]
10. "Pearl 700" is the marketing name for the BR700-730B2-14 engine model



SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

AGB	Accessories Gearbox
EASA	European Union Aviation Safety Agency
ESF	Equivalent Safety Finding
FADEC	Full Authority Digital Engine Control
HPC/HPT	High Pressure Compressor/Turbine
ICAO	International Civil Aviation Organisation
IDG	Integrated Drive Generator
LPC/LPT	Low Pressure Compressor/Turbine
SC	Special Condition
TC	Type Certificate
TCDS	Type Certificate Data Sheet
TGT	Turbine Gas Temperature

II. Type Certificate Holder Record

n/a

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	14 th September 2022	Initial Issue	14 th September 2022
Issue 02	12 th October 2023	Incorporation of changes resulting from Major Changes ETCDS Update Approval Nr. 10083002 and Software F4.0.2 Approval Nr. 10082560 and corrections of clerical errors.	

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