

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION TYPE CERTIFICATE DATA SHEET E00061EN	TCDS NUMBER E00061EN REVISION 1 BMW ROLLS-ROYCE GmbH MODELS: BR700-715A1-30 BR700-715B1-30 BR700-715C1-30 AUGUST 17, 1999
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Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E00061EN) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations, provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE CERTIFICATE (TC) HOLDER BMW Rolls-Royce GmbH
 Postfach 1246
 61402 Oberursel
 Germany

I. MODELS	BR700-715A1-30	BR700-715B1-30	BR700-715C1-30	
TYPE	Two spool axial flow engine consisting of a single stage fan, a two stage booster, a ten stage axial flow compressor, an annular combustion chamber, a two stage axial flow high pressure turbine, a three stage axial flow low pressure turbine, an accessory gearbox, and a Full Authority Digital Engine Control (FADEC).			
RATINGS (See NOTE 5)				
Maximum Continuous Thrust lbf/kN (See NOTE 18)	17,700/78.74	20,160/89.68	20,420/90.84	
Takeoff Thrust, lbf/kN (See NOTE 18)	18,710/83.23	20,160/89.68	21,430/95.33	
EQUIPMENT	In accordance with the Type Design Definition. Approved equipment is listed in BRR report E-TR494/97(FR), Issue 4 "Engine Equipment Classification", or later approved issues.			
OVERALL DIMENSIONS (mm/in)				
Length	3738/147.2	3738/147.2	3738/147.2	
Diameter	1638/64.5	1638/64.5	1638/64.5	
WEIGHT (DRY) (kg/lbs)				
	2085/4595.5	2085/4595.5	2085/4595.5	

CERTIFICATION BASIS FAR 33, effective February 1, 1965, as amended by 33-1 through 33-18 inclusive, including draft FAR's 33.76 and 33.78, and FAR 34.

MODEL	APPLICATION DATE	TYPE CERTIFICATE ISSUED	TYPE CERTIFICATE CANCELED
BR700-715A1-30	Dec. 19, 1995	Sep. 1, 1998	
BR700-715B1-30	Dec. 19, 1995	Sep. 1, 1998	
BR700-715C1-30	Dec. 19, 1995	Sep. 1, 1998	

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LEGEND: "-" INDICATES "SAME AS PRECEDING MODEL"
 "--" INDICATES "DOES NOT APPLY"
 NOTICE: SIGNIFICANT CHANGES ARE BLACK-LINED IN THE LEFT MARGIN.

PRODUCTION BASIS
IMPORT REQUIREMENTS

To be considered for installation on United States registered aircraft, each engine to be exported to the United States shall be accompanied by a certificate of airworthiness for export, or certifying statement endorsed by the exporting cognizant civil airworthiness authority, which contains the following language:

These engines conform to the United States type design (Type Certificate Number E00061EN) and are in a condition for safe operation.

These engines have been subjected by the manufacturer to a final operational check and are in a proper state of airworthiness.

Reference FAR Section 21.500, which provides for the airworthiness acceptance of aircraft engines or propellers manufactured outside of the United States for which a United States type certificate has been issued.

Additional guidance is contained in FAA Advisory Circular 21-23, Airworthiness Certification of Civil Aircraft, Engines, Propellers, and Related Products, imported into the United States.

NOTES

NOTE 1. Maximum Rotational Speeds:

Low Pressure Turbine N1 (RPM)	
-Maximum Take-off (See NOTE 18)	6096
-Maximum Continuous	6096
-Maximum Overspeed (20 sec.)	6204
-Reverse Thrust (max. 30 sec.)	3810
-Emergency Reverse Thrust	5576
High Pressure Turbine N2 (RPM)	
-Maximum Take-off (See NOTE 18)	16661
- Maximum Continuous	16661
-Maximum Overspeed (20 sec.)	16744

100% N1 equals 6,195 RPM

100% N2 equals 15,898 RPM

NOTE 2. Temperature Limits

Turbine Gas Temperature (Trimmed)

°C/°F

Takeoff (See NOTE 18)	900/1652
Maximum Continuous	850/1562
Maximum Overtemperature (max 20 sec)	915/1679
Maximum prior to start	150/302
Starting on ground	700/1292
Starting in flight	850/1562

Oil temperatures (°C/°F)

Minimum for Starting	-40/-40
Minimum for Acceleration for take-off	20/68
Maximum	160/320

Fuel Temperatures (°C/°F)

LP Pump Inlet, Max.	54/129
HP Pump Outlet, Max.	160/320 (185/365)*
LP Pump Inlet Min.	
Take-off, climb, go-around	-42/-44
Flight above 15,000 ft.	-48/-54

(* Transiently permitted for a period of not more than 15 minutes.)

NOTE 3

Fuel and Oil Pressure Limits

Fuel Pressure	Minimum at LP fuel pump inlet:	13.79 kPa/2.0 psig true vapor pressure
Differential Oil Pressures:	Minimum Acceptance for Flight in the Range:	
	Idle to 11514 RPM N2:	241.2 kPa/35 psig
	11514 RPM N2 to 14293 N2:	straight line interpolation from 241.2 kPa/35 psig to 310.3 kPa/45 psig
	Above 14293 RPM N2:	310.3 kPa/45 psig
	Minimum to Complete Flight:	
	Idle to 11514 RPM N2:	172.4 kPa/25 psig
	11514 RPM N2 to 14293 N2:	straight line interpolation from 172.4 kPa/25 psig to 241.3 kPa/35 psig
	Above 14293 RPM N2:	241.3 kPa/35 psid

NOTE 4.

<p>Bleed Extraction: EPR = P50/P20: The amounts of bleed extraction from stages 5 and 8 respectively are related to the core entry mass flow, W26. The amount of fan bleed extraction is related to the bypass mass flow, W12. Normal flow represents maximum bleed to be used for normal twin engine operation. Maximum flow represents cabin air bleed for single or twin engine operation and maximum anti-ice bleed.</p>

Power Range

Idle to 1.15 EPR
 1.15 to 1.25 EPR
 1.25 to 1.3 EPR
 Above 1.3 EPR

Maximum Flow (%)		
Stage 5	Stage 8*	Fan
9	15	1.4
10	10	1.5
10	10	1.5
10	10	1.5

*** Stage 8 bleed is cleared for operation up to and including Maximum Continuous rating.**

NOTE 5.

The ratings are defined at sea level ISA standard day conditions using a defined test bed configuration for the air intake and exhaust systems with all optional bleeds closed and the aircraft service equipment drives unloaded, at a fuel low heat value of 43.179 kJ/kg (22.72 CHU/kg).

NOTE 6.

ACCESSORY DRIVE PROVISIONS for ALL MODELS:

	Direction* of Rotation ¹	Transmission Ratio	Shear Neck Torque Lbs-in (daNcm)	Weight Lbs (kg)	Static Overhang Moment (Lbs-in) (daNcm)	Maximum Power Extraction (hp) (kW)
Hydraulic Pump	CCW	0.234	1496-2000 (1690-2260)	19.84 (9.0)	73.4 (82.9)	24.9 (18.6)
Integrated Drive Generator	CW	0.501	3150-3651 (3559-4125)	71.9 (32.61)	500 (565.0)	96.4 (71.9)

*CW: clockwise; CCW: counterclockwise, looking normal to pad along shaft

- NOTE 7. Operating and Service Instructions for all models:
Installation Drawing and Manual E-TR216/98 (FR) Issue 1
Operating Instructions OI-715-3BR
Maintenance Manual M-715-3BR
Engine Manual E-715-3BR
Time Limits Manual T-715-3BR
- NOTE 8. The engine is approved for operation with the Boeing thrust reverser (not part of the engine):
Assembly number, P/N 715-0021-505 for left hand and right hand installations.
- NOTE 9. The BR700-715 series engines meet Federal Aviation Administration requirements for adequate turbine disk integrity and rotor blade containment and does not require external armoring. Certain engine parts are life limited. These limits are listed in the BR715 Time Limits Manual.
- NOTE 10. Full Authority Digital Engine Control (FADEC): Electronic Engine Control (EEC) Part Number (P/N) 111E9430G609 or later approved standards for the BR700-715 series engines. The EEC software has been developed and verified in accordance with RTCA/DO-178B (The software standard is included in the P/N).
- NOTE 11. Lightning and EMI protection capability of the electronic engine control system, are specified in the BR700-715 Installation Manual.
- NOTE 12. Engine overhauls are permitted by the manufacturer only, as long as the Engine Manual is not available.
- NOTE 13. Information on engine operation with FADEC system dispatch limitations is contained in report E-TR436/98 (FR) Issue 01 or later approved issues for all models.
- NOTE 14. The engine meets the smoke and hydrocarbon emission requirements of FAR 34 and the carbon monoxide and nitrogen oxide requirements of International Civil Aviation Organization Standards.
- NOTE 15. The BR715 engine meets the fuel venting emissions requirements of FAR 34.
- NOTE 16. Approved fuels and fuel additives are listed in the latest issue of the BR715 Operating Instruction, OI-715-3BR.
- NOTE 17. Approved oils are listed in the latest issue of the BR715 Operating Instructions, OI-715-3BR.
- NOTE 18. Use of takeoff thrust for more than five minutes (not to exceed ten minutes) is approved for use only in the event of an inoperative engine due to shutdown or failure.
- NOTE 19. The maximum permissible engine inlet distortion limit is specified in the applicable BR715 Installation Manual.

---THE END---