

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E20EU Revision 4 ROLLS-ROYCE Ltd., Aero Division-Bristol/ S.N.E.C.M.A. Olympus 593 Mk. 610-14-28 January 15, 1981

TYPE CERTIFICATE DATA SHEET NO. E20EU

Engines and models described herein conforming with this data sheet (which is part of Type Certificate No. E20EU), and other approved data on file with the Federal Aviation Administration (FAA), meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the FAA regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approval instructions.

Type Certificate Holder	Rolls-Royce Limited, Aero Division-Bristol P.O. Box 3, Filton, Bristol, England S.N.E.C.M.A. 2 Bd. Victor, Paris 75015, France
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Model	Olympus 593 Mk. 610-14-28		
Type	Turbojet - 2 spool turbojet (type 610) with exhaust assembly incorporating primary nozzle with reheat (type 14) and secondary nozzle reverser (type 28). 7 stage low pressure compressor driven by a single stage axial turbine. 7 stage high pressure compressor driven by a single stage axial turbine. Annular combustion system incorporating vaporizers.		
Rating	<u>Static thrust at sea level, lb.</u>	<u>L.S.A.</u>	<u>L.S.A. + 15°C</u>
	<u>Without Reheat</u>		
	Maximum Continuous	28,800	27,190
	Takeoff (5 min.)	31,350	29,920
	<u>With Reheat</u>		
	Takeoff (5 min.)	37,080	35,220
	Max. Contingency (2.5 min.) (See NOTE 7B)	38,130	36,650
	Intermediate Contingency (15 min.)	32,800	30,760
	Transonic (15 min.)	32,800	30,760
	Approved Types (See NOTE 7)		
Fuel	<u>Components</u>		
	Fuel Control Units	Lucas Aerospace Ltd. Type FCU117 or 117M	
	Reheat Fuel Controller	SNECMA Type 301.244/014/015/016/017/019	
	Fuel Pump - 1st Stage	Lucas Aerospace Ltd. FSP117 or FSP117M	
	- 2nd Stage	Lucas Aerospace Ltd. SSP105 or SSP105M or SSP106 or SSP106M.	
	Starter Pump	Lucas Aerospace Ltd. ESP102 or ESP102M	
	L.P. Governor Overspeed Amplifier	Lucas Aerospace Ltd. LSG 103/3/E	
	Engine Control Amplifier	Ultra Electronics Ltd. A6A16/24CA, A6A16/24CC, and A6A16/24DC.	
	Reheat Control Amplifier	Blecma 620-357-017, -018, -081, -082.	
	Reheat Flame Detector	SNECMA 525-700-562, -745.	

Page No.	1	2	3	4
Rev. No.	4	4	4	4

Revised 12/94

Model	(cont'd)	Olympus 593 Mk. 610-14-28		
Oil		Approved Types (See NOTE 7)	Mobil RM.193A-3; Snell ASTO 555; Esso ETO 25; B.P. Energet 523.	
		Total Capacity (U.S. Quarts)	26	
		Integral Oil Tank, Max. Capacity (U.S. Quarts)	16	
		Usable oil (U.S. Quarts)	Min. 12.5	
Principal Dimensions, Inches		Length (Flange to Flange)	148.4 (3.77m)	
		Diameter (At Intake Flange)	47.8 (1.220m)	
Weight (dry) Pounds		Dry weight of flange engine with all required equipment including air starter but excluding reheat components and no residual fuel or oil.	6510	
		Weight of optional external equipment - fuel flowmeter.	5	
		Estimated weight of residual fuel & oil	39	
Center of Gravity (dry) Inches		Forward of main engine mounting trunnion center line.	13.4	
		Below engine horizontal center line	2.0	
Ignition		Ignition Unit	Lucas Aerospace Ltd.	NB 10705
		Igniters (2)	Champion Sparking Plug Co. Ltd.	CBS 112-3 & 112-4
Certification Basis		FAR 21.29 and FAR 33 effective February 1, 1965, as amended by Amendment 33-1 through 33-3, plus Special Conditions No. 33-40-EU-10 and Amendment No. 1 thereto, dated December 6, 1974.		
		Type Certificate No. E20EU issued March 17, 1978. Effective date of application for type certification: January 19, 1967.		
		Pursuant to FAR 21.29(a)(ii) type certificate was issued in validation of the Anglo/French certification of compliance with Special Conditions No. 33-40-EU-10 including Amendment No. 1; and Anglo/French TSS Standards which were found to provide a level of safety equivalent to the above FAR 33 regulations as follows: The Anglo/French Supersonic Transport TSS Standards as defined in Contents List No. 29, dated March 26, 1976, Part 0, Number 0-0, 0-1, and Appendix; Part 6 Number 6-5, 6-6, 6-8, 6-9, and Appendices to each and 6-7.		
Import Requirements		Each individually imported engine unit must be accompanied by a Rolls-Royce Limited, Aero Division-Bristol/Societe Nationale d'Etudes et de Construction de Moteurs d'Aviation, CAA or Bureau Veritas approved "Inspection and Test Certificate" signed by a person authorized by CAA or B.V. as appropriate and containing the following statement: "The engine unit covered by this certificate conforms to the type certificate and is in condition for safe operation, and has been subjected by the manufacturer to a final operational check".		
Additional Requirements		SFAR 27 as amended by Amendments 1 and 2 thereto.		

NOTE 1.	<u>Rotor Speed Limitations</u>	<u>N1 %</u>	<u>N2%</u>
	Takeoff (5 min.), with or without reheat	102.0	105.7
	Maximum Continuous	102.0	105.3
	Maximum Contingency (2.5 min.)	102.0	106.8
	Intermediate Contingency and Transonic (15 min.)	102.0	105.1
	Maximum for Reverser Ground (45 sec.)	- -	98.0
	in flight (4 min.)	As obtained at reverse idle	
	Maximum Overspeed (20 sec.)	108.5	110.0
	Minimum Ground Idle	- -	60.0
	(100% N1 = 6,500 rpm; 100% N2 = 8,530 rpm)		
NOTE 2.	<u>Temperature Limitations (°C)</u>		
	<u>Maximum Exhaust Gas</u>		
	Takeoff (5 min.) with or without reheat		806
	Maximum Continuous		739
	Maximum Contingency (2.5 min.)		833
	Intermediate Contingency and Transonic Acceleration (15 min.)		755
	Momentary during Starts and Relight (2 sec.)		550
	<u>Oil Temperature at Pressure Pump Inlet</u>		
	Maximum during Takeoff		125
	Maximum Continuous		190
	Maximum Transient (5 min.)		195
	Minimum for Starting		-35
	Minimum for Motoring Cycle		-40
	Minimum for Opening Up		-20
	<u>Fuel Temperature at Burner Manifold Inlet (See NOTE 7B)</u>		
	Minimum for Starting and Relighting		-40
	Minimum for Opening Up		20
	Maximum for Maximum Continuous		150
	Maximum Transient (2 min.)		170
NOTE 3.	<u>Fuel and Oil Pressure Limits</u>	<u>p.s.i.</u>	
	Fuel - Minimum at Engine Inlet (See NOTE 7B)	12.5 absolute	
	Fuel Filter Differential - Maximum	7	
	Oil - Differential relative to Intermediate	Without Mod.	With Mod.
	Casing Oil Space	<u>8562 installed</u>	<u>8562 installed</u>
	Normal Range	18 to 30	10 to 20
	Minimum for Flight at Ground Idle	18	10
	Minimum to Complete Flight	13	5
NOTE 4.	The ratings are based on static test stand operation under the following conditions:		
	- Compressor inlet air at 59°F and 29.92"Hg.		
	No aircraft accessory loads or optional air extraction.		
	Intake venturi to Rolls-Royce drawing No. RL83649.		
	Variable primary nozzle assembly type 14 installed but secondary nozzle not installed.		
	Exhaust gas temperature measured by 8 thermocouples as defined in D.I.S. 843, issue 7, or subsequent approved issues.		
	Static ratings corrected in accordance with RT.1040.		

NOTE 5. Accessory drive provisions:

		Speed Ratio to HP	Torque (in. -lb.)		Overhang Moment
Drive	*Rotation	Turbine Shaft	Cont.	Static	(in. -lb)
Starter	cc	.805:1	7800(stall)	22700 (shear neck)	216
I.D.G.	c	.805:1	1547	8905	203
Hydraulic Pump (Main)	cc	.4355:1	1690	3617	127
Hydraulic Pump (Standby)	c	.4355:1	900	2179	82
First Stage Fuel Pump	cc	1.414:1	425	2751	141
Fuel Control	c	.526:1	40	230	349
Unit with Second Stage Pump (air driven)	c				

*Clockwise (c) or counterclockwise (cc) looking on the drive face of the accessory.

NOTE 6. Maximum permissible air bleed extraction:

Maximum RPM for air bleed extraction - unrestricted.

Max Bleed for Eng. & Airplane Services	Air Mass Flow Lb/Sec.	% Total No-Bleed Mass Flow
Cabin Conditioning -		
Normal Max.	1.2	--
Emergency Max.	2.4	--
Engine Anti-icing, Max.	--	0.52
Fuel Heating (below 5°C fuel temp) Max.	--	0.52

- NOTE 7. A. Approved fuels & fuel additives, approved lubricating oils and limitations appropriate to each are listed in Technical Publication No. TP.178/B.E.D., Olympus 593 Mk. 610-14-28 Operating Instructions, Ch. 2 and Appendix 3, dated May 28, 1975 or later approved revision.
- B. For wide-cut type (AVTAG JP.4) or mixture of wide-cut and Kerosene type (AVTUR JP.1) fuels the following limitations apply:
1. Minimum fuel inlet pressure - 20 psia.
 2. Maximum fuel temperature 50°C. Refer to Engine Operating Instructions for techniques to avoid exceeding this limit.
 3. Use of Maximum Contingency Power is prohibited.

NOTE 8. Life limited parts are identified in Chapter 5 of the Olympus 593 Mk. 610-14-28 Engine Maintenance Manual, TP 181/1/R/SN.

NOTE 9. Olympus 593 Mk. 610-14-28 manuals approved by the Anglo/French Authorities accepted as equivalent to FAR 33.5 requirements are as follows:

- Operating Instructions	TP.178/B.E.D.
- Maintenance Manual	TP.181/1/RR/SN
- Installation Manual	See NOTE 10.
- Overhaul Manual	TP.187/1/RR/SN and TP.187/1/RR/SN

NOTE 10. The Olympus 593 Mk. 610-14-28 is limited to installation on the French/British Concorde airplane.

NOTE 11. This engine approval includes the engine unit, primary and secondary nozzle with reverser as defined on RR DIS 843, issue 1, or later, for the Mk 610-14-28 as approved by the CAA.

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