

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E1EU
Revision 2
Gnome H.1000 Mks 510, 511
Gnome H.1200 Mk. 610
Mks. 640, 641
Mks. 640A, 641A

March 28, 2007

TYPE CERTIFICATE DATA SHEET NO. E1EU

Engines of models described herein conforming with this data sheet (which is part of type certificate no E1EU) and other approved data on file with the Federal Aviation Agency, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Civil Air Regulations provided they are installed, operated and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate holder: Bristol Siddeley Engines Limited
Leavesden
Hertfordshire, England

Model	H.1000 Mk.510	H.1000 Mk.511	H.1200 Mk.610	H.1200 Mks.640, 641,640A,641A
Type Axial flow, free turbine turboshaft Ten stage compressor. Annular combustion chamber. Two stage gas generator turbine. Single stage power turbine.				
	2.926:1 main reduction gearbox and forward drive shaft.	----	----	----
Ratings (see Notes 4 and 11) at nominal power speed, r.p.m.				
	19300	19300	19500	19500
Max. continuous at sea level; output s.h.p.				
	875	895	1020	1050
Takeoff (5 mins) at sea level; output s.h.p.				
	972	1020	1215	1250
30-min. Helicopter rating at sea level; output s.h.p.				
	---	---	---	1250
Fuel control				
	Hawker Siddeley Dynamics electrical Computer and Throttle Actuator with Lucas hydraulic Integrated Fuel system.			
Computer				
	PQ.2154/2	----	PQ.2163	PQ.2158
Throttle Actuator				
	PQ.2142/2	----	----	----
Integrated Fuel System				
	IFS.100	----	IFS.102	----
Fuel				
	1. Aviation Kerosene Specs British: D.Eng.R.D.2482,2494 American: ASTM.D1655-61T Type A, or A-1 Canadian: 3-GP-23e type 1			
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Model (cont.)	H.1000 Mk.510	H.1000 Mk.511	H.1200 Mk.610	H.1200 Mks.640 641,640A,641A
Fuel (cont.)	2. Aviation Wide Cut Spec. British: D.Eng.R.D.2486 American: ASTM.D.1655-61T Type B Canadian: 3-GP-22e type 2	----	----	----
	3. High Flash Aviation Kerosene Specs. British: D.Eng.R.D.2488,2498 Canadian: 3-GP-24d	----	----	---
	No fuel control adjustment is required when changing from one type of fuel to another or when using a mixture of fuels.	----	----	----
Oil	Esso Aviation Turbo Oil 35 Esso Turbo Oil 35 Esso Turbo Oil TJ-15	----	----	----
Principal dimensions				
Length, ins.	66	----	----	59
Max. diameter, ins.	16	----	----	----
Weight (dry), lb. (includes essential engine-mounted, engine accessories, starter and bullet, turbine bucket guard; also main reduction gearbox, forward drive shaft and pedestal bearing for Mks.510, 511 and 610 models)	463	----	484	345
a) Computer (a/c mounted), lb.	18	----	----	----
b) H.E. Ignition Unit (a/c mounted), each, lb.	4	----	----	----
C.G. location, excluding items (a) and (b)	with starboard exhaust	----	----	with down exhaust
Aft of front mount centerline, ins.	25.0	----	----	17.8
Below engine centerline, ins.	1.0	----	----	0.7
Offset to Port, ins.	2.3	----	----	0.4
Ignition Systems (24 volts D.C., 150 watts max.)	Two A.E.I. High Energy Ignition Units type C44TS/1	----	----	----
Igniter plugs	Smith type 901-1	----	----	----

"- - -" indicates same as preceding model

"-----" indicates does not apply

CERTIFICATION BASIS

CAR 10 and British Civil Airworthiness Requirements, Section C.
(The BCAR Section C is equivalent to U.S. CAR Part 13 effective
June 15, 1956 as amended by 13-1 through 13-5).
Type Certificate No. E1EU issued April 28, 1964.
Date of application for Type Certificate October 10, 1961.

The aviation authority for the United Kingdom (UK), the UK Civil Aviation
Authority (CAA), originally type certificated this engine. The FAA validated this
product under U.S. Type Certificate Number E1EU. Effective September 28, 2003,
the European Aviation Safety Agency (EASA) began oversight of this product on
behalf of the UK.

IMPORT REQUIREMENTS

To be considered eligible for installation on U.S. registered aircraft, each new engine to be exported to the United States with UK CAA or EASA airworthiness approval shall have a Joint Aviation Authorities (JAA) or EASA Form 1, Authorized Release Certificate. The JAA or EASA Form 1 should state that the engine conforms to the type design approved under the U.S. Type Certificate E1EU, is in a condition for safe operation and has undergone a final operational check.

NOTE 1. Maximum permissible gas generator operating speeds (r.p.m.) are as follows:

Maximum continuous	25750	----	25300	----
Takeoff	26300	----	----	----
30 minute helicopter rating	—	—	—	26300

NOTE 2. Maximum permissible temperatures:

Power Turbine Inlet*				
Takeoff	1103°F (595°C)	1157°F (625°C)	1265°F (685°C)	1265°F (685°C)
30-mins. power	—	—	—	1265°F (685°C)
Maximum continuous	1049°F (565°C)	1103°F (595°C)	1175°F (635°C)	1175°F (635°C)
Starting	1238°F (670°C)	1238°F (670°C)	1238°F (670°C)	1238°F (670°C)
Oil Inlet	212°F (100°C)	212°F (100°C)	212°F (100°C)	230°F (110°C)

* The power turbine inlet gas temperature is measured by (8) thermocouples mounted in a radial plane in the second stage turbine casing.

NOTE 3. Fuel and oil pressure limits

Fuel, minimum at engine inlet:	See Bristol Siddeley Report DDR No. 88	----	See Bristol Siddeley Report DDR No. 100	----
Oil:				
Engine, at ground idling and in autorotation	15 p.s.i.g. minimum			
Normal operating range	35-45 p.s.i.g.			
Minimum to complete flight	30 p.s.i.g.			
Main Reduction Gearbox				
Normal operating range	80-90 p.s.i.g.			
Minimum to complete flight	60 p.s.i.g.			

NOTE 4. Accessories Drive provisions

Drive	Type	Direction of Rotation *	Speed **	Maximum Torque (in-lb)	
				Continuous	Static
Starter	Special	cc	1.0	180	336
Centrifugal Fuel Filter	Special	cc	0.1602	5	50
Gas Gen. Tachometer	SBAC RS.307	c	0.1602	7	50
Power Turbine (Mks. 510, 511, 610)					
Tachometer No. 1	SBAC RS.570	cc	0.2154	7	50
Tachometer No. 2	SBAC RS.307	cc	0.2154	7	50
Power Turbine (Mks. 640, 641, 640A, 641A)					
Tachometer	SBAC RS.307	c	0.216	7	50
*	"c" - Clockwise	"cc" - Counter clockwise		facing engine pad.	
**	Speed - Times prime mover r.p.m.				

NOTE 5. Engine ratings are based on calibrated stand performance under the following conditions:

- Static sea level standard conditions of 59°F and 29.92 in.Hg.
- Bristol Siddeley Air Intake Pt. No. WD.347-35, and Exhaust unit Pt. No. HP.562 (item 2)
- Bristol Siddeley Starter bullet nose Pt. No: 8580
- No external air bleed or accessory drive power for aircraft accessories.
- No anti-icing airflow.
- Additional performance parameters are contained in Bristol Siddeley Performance Brochure TC 602 (Mk.510), TC 607 (Mk.511), TC 603/2 (Mk.610), TC 604/3 (Mks.640, 641, 640A, 641A)
- Output shp ratings allow for gear box losses where applicable.

NOTE 6. Maximum permissible air bleed extraction is 6.3% of no-bleed mass flow, over whole range of Gas Generator r.p.m. subject to limiting power Turbine Inlet Temperature not being exceeded.

NOTE 7. Power Turbine Normal Operating Range.
The nominal power turbine operating speed is 19300 r.p.m. (Mks.510, 511, 610) and 19500 r.p.m. (Mks.640, 641, 640A, 641A).
The operating range must not exceed the following limits:

<u>Model</u>	<u>Max. for Autorotation</u>	<u>Power On</u>	
		<u>Minimum</u>	<u>Maximum</u>
Mk. 510	21,000	17,700	19,700
Mk. 511	21,000	17,800	19,700
Mk. 610	21,000	17,800	20,100
Mks. 640,641,640A,641A	21,000	17,500	19,500

NOTE 8. Main Reduction Gearbox Output Shaft Torque Limits (Mks. 510, 511, 610)

Takeoff	11,160 in.lb.
Max. continuous	10,200 in.lb.
Max. overtorque	11,520 in.lb.

Power Turbine Shaft Torque Limits (Mks. 640, 641, 640A, 641A)

No limits provided that all other operating limitations are not exceeded.

NOTE 9. To be eligible for use in certificated aircraft, the engine installation must include an accurate engine output torque measuring device or an acceptable alternate means of determining engine power.

NOTE 10. These engines meet FAA requirements for operation in icing conditions, for adequate turbine disc integrity and rotor blade containment and do not require airframe-mounted armouring.

NOTE 11. Maximum permissible overspeeds are:

Gas Generator,	(Mks. 510, 511)	27,100 r.p.m. for 20 seconds
	(Mks. 610, 640, 641, 640A, 641A)	27,550 r.p.m. for 20 seconds
Power Turbine,	(Mks. 510, 511, 610)	21,650 r.p.m. for 20 seconds
	(Mks. 640, 641, 640A, 641A)	23,100 r.p.m. for 20 seconds

When either of these limits is exceeded, the engine must be disassembled for inspection.

NOTE 12. Below 59°F the sea level static maximum power limits for the H.1200 engine will increase as follows:

To 1328 PT.SHP maximum at 39°F for take-off, to 1207 PT.SHP maximum at 19°F for maximum continuous. Refer to B.S.E. Performance Brochures TC.603/2 and TC.604/3 for variations in power between standard day and ambient temperatures listed above.

These maximum power limits of 1328 PT.SHP for takeoff and 1207 PT.SHP for maximum continuous are also authorized for use at any ambient temperature for engines whose individual characteristics permit higher than normal powers to be developed without exceeding operating limits.

Note 13 Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or, for approvals made before September 28, 2003 by the United Kingdom Civil Aviation Authority. Any such documents including those approved under a delegated authority, are accepted by the FAA and are considered FAA approved.

- Service bulletins,
- Structural repair manuals,
- Vendor manuals,
- Aircraft flight manuals, and
- Overhaul and maintenance manuals.
- Technical Variances

These approvals pertain to the type design only.