

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

E1IN
Revision 7
TURBOMECA
Artouste 111B
Artouste 111B1
Artouste 111D
March 20, 2007

TYPE CERTIFICATE DATA SHEET E1IN

Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E1IN) 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: Turbomeca S.A.
64 511 Bordes Cedex
France

I. MODELS	Artouste IIIB	Artouste IIIB1	Artouste IIID
TYPE Turboshaft for helicopters	single stage axial compressor single stage centrifugal compressor annular combustion chamber three stage turbine 5.802:1 reduction gearing	-- -- -- -- --	--(see NOTE 11) -- -- -- 5.7131:1 reduction gearing
RATING (See NOTE 3)		--	--
Maximum continuous at sea level, shaft hp., r.p.m.	690 - 33,500 (+1000 rpm transients permitted (Limited to 543 HP by engine gear box)(405kw)	-- --	-- --
Takeoff at sea level, Shaft hp., r.p.m.	858 - 33,500 (+1000 rpm transients permitted) (T.O. power limited to 5 min.))limited to 563 HP by engine gear box)(420kw)	--	--
Drive shaft type	Special, 24 internal involute splines according to and 20006 type XVID specification, pitch circle diameter, in : 1.20	--	--
Fuel Control	Turbomeca governor, 0.64.39.000.0 or 0.064.39.500.0 Turbomeca fuel pump, 0.044.49.000.0 or 0.044.49.501.0 Semca fuel cock, 0.100.85.725.0 or 0.202.12.788.0 Turbomeca automatic starting box, 0.077.47.000.0 or 0.077.51.502.0 Turbomeca micropump (for starting) 0.044.56.000.0 or 0.044.61.501.0	-- -- -- --	0.64.39.501.0 0.044.49.502.0 0.202.12.788.0 0.077.98.524.0 0.044.61.501.0
FUEL	See NOTE 9	--	--
LEGEND: "--" INDICATES "SAME AS PRECEDING MODEL" "---" INDICATES "DOES NOT APPLY"			

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I. MODELS:	Artouste IIIB, IIIB1	Artouste 111D	
OIL	See NOTE 10		
Principal dimensions			
Length, in.	71.4	--	
Width, in.	20.5	21.85	
Height, in.	26.25	24.70	
C. G. Locations:			
Aft of front mounts, in.	18.1	--	
Weight (dry) lb. (includes all controls, fuel pump) starter-generator. Excludes tailpipe and oil tank).	393	--	
Ignition System			
	Low energy type (27-vole supply) with two Turbomeca 0.206.30.773 or 0.237.30.775.0 torch igniters	--	
	Dual ignition coil, Air-Equipment 81.264 or 81.268/10	--	
Certification basis			
	CAR 10 (FAR 21.29)Engine Type Certificate No. E11N issued 27 March 1962. Date of Application for Type Certificate 18 February 1960.		
	The aviation authority for France, the Direction Generale de L'Aviation Civile (DGAC), originally type certificated this engine. The FAA validated this product under U.S. Type Certificate Number E11N. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf of France.		
Import Requirements			
	To be considered eligible for installation on U.S. registered aircraft, each new engine to be exported to the United States with the DGAC 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 E11N, is in a condition for safe operation and has undergone a final operational check.		
NOTE 1.	Maximum permissible temperatures:	<u>Artouste IIIB, IIIB1</u>	<u>Artouste 111D</u>
	Gas temperature at turbine outlet:		
	Maximum takeoff (5 min.)550°C(1020°F)	--	--
	Maximum continuous 500°C (930°F) (The turbine exhaust gas temperature is measured by 2 thermocouples.)	--	--
	Oil inlet temperatures for engine operation: 32° to 185°F (0° to 85°C)	--	--
NOTE 2.	Fuel and oil pressure limits:		
	Fuel, at engine inlet:(4.3 to 11.6 p.s.i.g. for starting)	--	--
	(-4.3 to 17.4 p.s.i.g. when operating)	--	--
	Oil (pressure at engine oil pump outlet) Normal: 20 to 70 psig	--	--
	Minimal:16 psig	--	--
	Minimum ground idle:10 psig	--	--
NOTE 3.	The engine ratings are the minimum guaranteed and are based on the following: Static sea level standard conditions of 59°F, 29.92 in. Hg. No external air bleed or aircraft accessory power. A typical jet pipe, although the engine is not sensitive to small differences in tailpipes. Exhaust gas temperature is measured by the 2 Turbomeca thermocouples installed on each engine.		

NOTE 4. The following drive provisions are provided on the engines:

	<u>Drive</u>	<u>Rotation (facing drive)</u>	<u>Speed Ratio</u>	<u>Continuous Torque (in.-lb.)</u>	<u>Static Torque (in.-lb.)</u>	<u>Overhang (in.-lb.)</u>
Acrouste IIIB	Starter-generator,	Counter-clockwise	1:5.1080	135	650	170
IIIB1	Labinal 2687 A or		1:5.0295	---	---	---
IIID						
Artouste IIIB	Tachometer,AMA	Counter-clockwise	1:10.00016	.02	10	6
IIIB1	Type 10					
IIID						

NOTE 5. Production engines are normally provided with a sonic orifice limiting engine bleed air to 65 grams per second. When DGAC approved Turbomeca Mod. TU 1 is incorporated, bleed flow is orifice limited to 170 grams per second.
Horsepower loss is 0.4 kilowatts per gram per second (243.5 HP/Lb/sec.)

NOTE 6. The engine is for use on helicopters and includes the following special equipment:
Isochronous speed governing system.
Automatic sequence device for starting.

NOTE 7. This engine meets FAA requirements for adequate turbine disk integrity and rotor blade containment and does not require external armoring.

NOTE 8. This engine has no provision for anti-icing the inlet and has not been substantiated for use in icing weather.

NOTE 9. Fuels shall conform to the specifications as listed in the table below or to subsequent revisions thereof. The mixing of approved fuels is permitted subject to the limitations specified under "Remarks: No adjustment of engine controls is necessary and no loss of performance occurs."

Normal fuels, unrestricted

SPECIFICATIONS						
FUEL TYPE	NATO SYMBOL				FREEZING POINT (Approximately)	ANTI-ICING ADDITIVE
		USA	UK	FRANCE		
Kerosene - 50 (AVTUR-FS-11) JP 8	F 34	MIL-T-83133 (JP 8)	D.ENG.RD 2453	AIR 3405 F34	-50°C	With
Kerosene - 50 (AVTUR) JP 1	F 35	ASTM-D-1665 Jet A1	D.ENG.RD 2494	AIR 3405 F-35	-50°C	Without
Kerosene	---	ASTM-D-1655 Jet A	---	---	-40°C	Without
Wide cut fuel (AVTAC FS 11) JP 4	F 40	MIL-T-5624 JP 4	D.ENG.RD 2454	AIR 3407	-58°C	With
Wide cut fuel (AVTAC) JP-4	---	---	D.ENG.RD 2486	---	-58°C	Without
Wide cut fuel	---	ASTM-D-1655 Jet B	---	---	-50°C	Without
High flash point Kerosene JP 5 (AVCAT)	F 43	---	D.Eng.RD 2498	AIR 3404 F-43	-46°C	Without
High flash point Kerosene JP 5 (AVCAT FS 11)	F 44	MIL-T 5624 JP 5	D.ENG.RD\2 452	AIR 3404 F-44	-46° C	With

FUEL TYPE	NATO SYMBOL	SPECIFICATIONS			RESTRICTIONS ON USE
		USA	UK	FRANCE	
Aviation Type Gasoline (AVCAS)	F 12	MIL-G-5527 Grade 80/87	---	AIR 3401 80/87	-Maximum operating time on gasoline during any period between overhauls total 25 hours.
	F-18	MIL-G-5572 Grade 100/130	D.ENG.RD 2485	AIR 3401 100/130	Operating altitude range: row 0 to 4000 m OAT from -50°C to +30°C
	F 22	MIL-G-5572	---	AIR 3401 115/145	- Add approx.2% of lubricating oil by volume (mineral based oil if possible).
Automotive Gasoline	F 46	MIL-G-3056	DEF 2402	DCEA/2MT80	-Use preferably the lowest possible lead content type of gasoline
Automotive Diesel oil 1	---	VVF 800 DF1	---	---	Not to be used at O.A.T. below -15°C
Automotive Diesel oil 2	F 54	VVF 800 DF2	TS 10 003	DCEA/21C	Not to be used at O.A.T. below -5°C
Artic Diesel Fuel	F 56	VVF 800 DFA	--	--	Not to be used at O.A.T. below -20°C
Gasoil O	F 75	MIL-F-16884	DEF 2 402	7 120 STM 47/0 Dieso	Not to be used at O.A.T. below -5°C
Gasoil 20	F 76	--	DEF 2 402	7 120 STM 47/20 Dieso	Not to be used at O.A.T. below +0°C
Illuminating Oil	F 58	VVK 221	DEF 2 403	DCEA/11 C	Not to be used at O.A.T. below -15°C
Gasoline	F 12	MIL-G-5572 (Grade 80/87)	---	AIR 3401	Maximum operating time on gasoline during any period between overhauls: 25 hours.
	F 18	(Grade 100/130)	D.ENG.RD 2485	AIR 3401	
	F 22	(Grade 115/145)	D.ENG.RD 2401	AIR 3401	
Automotive Gasoline	F 46	MIL-G-3056	DEF 2401	DCEA/ 2DMT80	Add 1 to 2% of lubricating oil by volume (mineral if possible)
Automotive Diesel Oil	F 54	VVF 800 DF2	TS.10.003	DCEA/21C	Not to be used at OAT below -5°C
	---	VVF 800 DF1	---	---	Not to be used at OAT below -15°C
	F 56	VVF 800 DFA	---	---	
Gasoil O	F 75	MIL-F-16684	DEF 2402 (47/0 DIESO)	7120 STM	Not to be used at OAT below -5°C
Gasoil 20	F 76	---	DEF 2402 (47/20 DIESO)	7120 SIM	Not to be used at OAT below -5°C
Illuminating Oil	F 58	VVK 211	DEF 2403	DCEA/11C	Not to be used at OAT below -15°C

The extended use of those fuels is not recommended. The restrictions connected with such a use and the associated maintenance instructions should be assessed on a case by case basis.

C - The following fuel additives are approved for use:

- Anti-icing additive: AIR 3652, NATO S748, MIL-I-27686, D.ENG.RD 2451, PHILLIPS PFA-55 MB each is eligible up to .15% in volume, with or without glycerine.
- Anti-static additive: SHELL ASR-3, up to 0.0001% in volume.

NOTE 10.

4.2 APPROVED OILS

FUEL TYPE	NATO SYMBOL	SPECIFICATIONS			RESTRICTIONS ON USE
		USA	UK	FRANCE	
Mineral: Fluid 3 to 3.5 cSt at 98.9°C	0.135	---	D.ENG.RD 2490	AIR 3515	Aeroshell oil 3 BP turbine oil 3 Esso aviation utility oil f EFF JET ENGINE OIL 15 CASTROLAERO CT 11
Synthetic fluid 3 to 3.9 cST at 98.9°C	0.148	MIL-L-7808	---	---	BP turbine oil 15 Castrol 3C CASTROL 325 Esso turbo oil 2389 Mobil oil Avrex 256 STAUFFER Jet oil 1
	0.150	---	---	AIR 3514	ELF jet synthetic oil 15 Turbonoycoil 13 B
	---	---	---	---	Aeroshell turbine oil 390
Synthetic Medium 5 cSt at 98.9°C OAT= -20°C	0.156	MIL-L- 23669	--	--	Elf Jet Synthetic oil 25 Esso Turbo oil 2380 Mobil Jet Oil 11 TURBONYCOIL 525 CASTROL 5 000 Aeroshell 500
Synthetic 7.5 cSt at 98.9°C OA = 10°C	0.149		DER D 2487		CASTROL 98 AEROSHELL 750 ESSO TURBO OIL 274
	0.159	--	--	AIR 3517	TURBONYCOIL 35 m TURBONYCOIL 35 A

NOTE:

1. The oil brands are indicated in alphabetical order.
2. the specification should be at the latest amendment.
3. The use of different oil spec. or brands must be submitted to TURBOMECA for approval.
4. In case of change of oil brand or specification, flush through the oil system according to Maintenance Manual Instructions.

	NATO	USA	UK	FRANCE	NOTES
GREASES	S 740 S 720	MIL-T 5544 MIL-M-7866	DTD 392	AIR 4247 AIR 4223	
Storage Oils	C 624	MIL-C-6529 Type III	DTD 900/4426 DED 2490 DEF 2001	AIR 1504 AIR 3515	Fuel system and external spray

NOTE 11 SERVICE INFORMATION:

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 Direction Generale de L'Aviation Civile (DGAC). 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.

These approvals pertain to the type design only.

...END...