COMANDO DA AERONÁUTICA
DEPARTAMENTO DE PESQUISAS E DESENVOLVIMENTO
CENTRO TÉCNICO AEROESPACIAL

TYPE CERTIFICATE DATA SHEET Nº EM-9306

Type Certificate Holder:

ALLISON ENGINE COMPANY
P.O. Box 420
Indianapolis, Indiana 46206-0420
USA

EM-9306
Sheet 01
ALLISON

250-B17C
250-B17F/2

August 1999

Engines of models described herein conforming with this data sheet, which is part of Type Certificate No. 9306, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other instructions.

MODEL 250-B17C and 250-B17F/2

TYPE Free turbine – turboprop, axial centrifugal compressor, 2 stage gas producer turbine, 2 stage power turbine , single combustion chamber

RATINGS (See Note 4)

	250-B17C	250-B17F/2
Maximum continuous at sea level, shp	420	450
Prop drive, rpm	2 030	--
Measured gas temp.	795°C (1 464°F)	777°C (1 430°F)

		250-B17C	250-B17F/2
	Takeoff: 5 min. at sea level, shp	420	450
	Prop drive, rpm	2 030	--
	Measured gas temp.	795°C (1 464°F)	777°C (1 430°F)
	Takeoff (augmented) at sea level, 35°C (95°F) ambient temperature, shp, 5 min.	420	#
	Prop drive, rpm (est.)	2 030	#
	Measured gas temp. (See Note 14)	810°C (1 490°F)	#
PROP DRIVE RATIO		16.399:1	--
PROP DRIVE		Flange 4" bolt circle	--
CONTROL SYSTEM (See Note 17)	Bendix gas producer fuel control:	DP-M1	DP-P2
	Woodward combination power turbine and propeller governor :	8210-018	8210-011
	Woodward propeller overspeed governor :	8210-011	8210-085

FUEL TYPE MIL-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM D1655 Jet A or A-1 (or Allison Spec. EMS-64) or Jet B; MIL-T-83133, Grade JP-8 (for other fuel and limitations See Note 8)

FUEL PUMP AND FILTER Sundstrand single element 024918 or 5002395 or TRW pump model 386500 (All Models)

OIL, LUBRICATION MIL-L-7808G or MIL-L-23699 and subsequent revisions (All Models)

IGNITION SYSTEM Capacitor discharge, low tension exciter type Simmonds Precision (GLA) P/N 43754 or P/N 49522 Bendix-Scintilla P/N 10-387150-1 P/N 10-374440-1 Champion spark igniter or P/N FHE 161-9 or CH 34168 or (AC P/N 5611071) (Type YB 63) or (AC P/N 5611588) (Type YB 63-1) or Auburn P/N 0270486

TEMPERATURE LIMITS See Note 1 --

		250-B17C	250-B17F/2
PRESSURE LIMITS		See Note 2	--
PRINCIPAL DIMENSIONS	Length overall, cm (in):	114.09 (44.92)	114.10 (44.924)
	Width, cm (in):	47.70 (18.78)	47.71 (18.784)
	Height, cm (in):	57.40 (22.60)	57.39 (22.596)
WEIGHT (dry)	Includes basic engine fuel pump and filter, ignition and fuel control system, kg (lb)	88.45 (195)	96.16 (212)
CENTER OF GRAVITY LOCATIONS	Aft. of gear box side mount centerline, cm (in):	6.85 (2.70)	6.45 (2.54)
	Lateral C. G.	0.66 (0.26) to left of engine centerline (looking fwd.-cm (in))	1.06 (0.42) to left of engine centerline (looking fwd.-cm (in))
	Vertical G. G. – above engine centerline	7.95 (3.13)	6.80 (2.68)

" -- " Same as preceding model " # " Does Not Apply

DATA PERTINENT TO ALL MODELS

IMPORT REQUIREMENTS Each engine imported separately and/or spare parts must be accompanied by an export airworthiness approval issued by FAA (or a third country authority, in case of used engine imported from such country) attesting that the particular engine and/or parts were submitted to the governmental quality control before delivery and are in conformity with the CTA approved type design.

CERTIFICATION BASIS

RBHA 33 which endorses Part 33 of the Federal Aviation Regulations effective February 1, 1965, as amended by 33-2 and 33-3, and Exemption No. 754 from FAR 33-69, Regulatory Docket 8338 dated November 30, 1967.

	Application	Issued TC
250-B17C	02 Jan. 1993	26 May 1993
250-B17F/2	30 June 1999	18 Aug. 1999

PRODUCTION BASIS Production Certificate No. 310.

NOTES

NOTE 1 Maximum permissible temperatures:

	250-B17C	250-B17F/2
Measured gas temperatures		
Takeoff :	810°C (1 490°F)	--
Maximum continuous:	810°C (1 490°F)	--
Maximum transient (not to exceed 6 seconds)	843°C(1 550°F) ten seconds maximum between 810°C (1 490°F)to 927 °F (1 700°C.)	--

Oil inlet temperatures

Minus 54°C(-65°F) to 82.22°C(180°F) for all models for MIL-L-7808F type oil. Minus 40°C(-40°F) to 82.22°C(180°F) for all models using MIL-L-23699 type oil. Temperatures up to 107°C (225°F) are permitted for the models 250-B17C and 250-B17F/2 when operating at powers not in excess of 165 hp. Temperatures up to 107°C (225°F) are allowed for five minutes when operating at powers in excess of 165 hp for model 250-B17F/2

NOTE 2 Fuel inlet and oil pressure limits:

Fuel:

(Applicable to MIL-T-5624, ASTM-D1655 Jet A, A-1 or B), minimum at fuel connection to engine: not less than ambient pressure minus 9.0 inHg at sea level, ambient minus 5.5 inHg at 6 000 ft, ambient minus 3.3 inHg at 10 000 ft, ambient minus 0.8 inHg at 15 000 ft, ambient plus 1.5 inHg at 20 000 ft, ambient plus 3.0 inHg at 25 000 ft. No fuel inlet depression permitted with MIL-G-5572 fuel. Maximum pressure 25 psig.

Oil:

Operating oil gauge pressure at 47 912 rpm (94.0 percent) gas producer speed and above is 110 to 130 psig for all models except 250-B17F/2 which is 120-130 psig .

43 325 rpm (85.0 percent) to 47 912 rpm gas producer speed is 90 to 130 psig .

Below 43 325 rpm gas producer speed 50 to 130 psig .

Oil pump inlet pressure 5 in. Hg absolute minimum when operating in the Beta range (propeller operating below selected governor rpm), the above minimum oil pressure limits are reduced by 15 psig.

NOTE 3 The following accessory drive mounting provisions are available:

	Direction * of Rotation	Speed Ratio to Turbine	Max. Torque		Overload Torque
			Continuous in.lb	Static in.lb	(10 sec.) in.lb
Driven by Gas Producer Turbine					
Spare (only model 250-B17C)	C	0.0728	35	75	#
Tachometer	CC	0.0824	7	50	#
Starter-Generator	C	0.2361	**	550	375

Driven by Power Turbine

Tachometer	CC	0.1262	7	50	#
Power Take-off ***	C	0.1807	4 611 (-B17C) 4 800 (-B17F/2)	8 000	3 490 (-B17C)

* - C - Clockwise viewing drive pad; CC- Counterclockwise

** - The maximum generator load is must be 150 amperes (9.3 hp) from idle to take off.

*** - The sum of the torque extracted in any combination from the front and rear power output drives shall not exceed the torque values specified in Note 6. The values given in the above table represent the 5 minutes and maximum continuous limited total torque.

NOTE 4 The engine ratings, unless otherwise specified, are based on static sea level standard conditions. Compressor inlet air (dry) 15°C (59°F)., 29.92 inHg. Compressor inlet bell attached to provide suitable air approach conditions. No external accessory loads and no customer air bleed. Measured rated gas temperature as indicated by average of the 4 gas temperature thermocouples.

NOTE 5 External air bleed may not exceed 4.5 percent for all models.

NOTE 6 Models 250-B17C:
The maximum allowable torque as measured by the torquemeter for below standard and/or ram conditions is 1165 lb.ft for 10 seconds; 1138 lb.ft for takeoff

Model 250- B17F/2
The maximum allowable torque as measured by the torquemeter for below standard and/or ram conditions is 1218 lb.ft for 10 seconds; 1185 lb.ft for takeoff

NOTE 7

- Gas producer speeds up to 105 percent for 15 seconds and up to 105 percent speed continuously for the 250-B17C and 250-B17F/2.
- Power turbine speeds up to 110 percent are permissible for 15 seconds and up to 105 percent continuously for 250-B17C and 250-B17F/2.
- The power turbine governor provides propeller overspeed protection.
- 100 percent gas producer speed is defined as and 50,970 rpm for 250-B17C and 250-B17F/2.
- 100 percent turbine speed is defined as 33,290 for the250-B17C and 250-B17F/2.

NOTE 8 Emergency use of aviation gasoline MIL-G-5572, grades 115/145 and lower, is limited to amount of fuel required to operate the engine for not over 6 hours during an overhaul period except that a mixture consisting of 1/3 by volume of aviation gasoline MIL-G-5572 grade 80/87, and 2/3 by volume of MIL-T-5624, grade JP-5, or aviation turbine fuels ASTM-D1655 Jet A or A-1 or Allison Spec. EMS-64 may be used for unrestricted periods of time. Fuels containing Tri-Cresyl-Phosphate additives shall not be used. It is not necessary to purge the unused fuel from the system before refueling with different type fuels. No fuel control adjustment is required when switching these fuel types. Anti-icing additives conforming to MIL-I-27686 are approved for use in fuels in amounts not to exceed 0.15 percent by volume. Shell anti-static additive is approved for use at a concentration that will not exceed fuel conductivity of 300 picomhos per meter.

NOTE 9 The 250-B17F/2 is similar to the 250-B17C except for increased performance, a new compressor, and incorporates an on-speed #1 wheel internal energy absorbing ring.

NOTE 10 These engines are approved for both tractor and pusher applications.

NOTE 11 Life limits established for critical components are published in the corresponding Allison Gas Turbine Operations and Maintenance Manual. Distributor Information Letters (DIL) 190 and 202 establish acceptable crack limits suitable for return to service of first stage and second stage turbine wheels, respectively, in time continued (repair) engines.

NOTE 12 Engines produced under this type certificate are approved for operation with unprotected inlets having been tested in accordance with Group I and Group 11 Foreign Object Ingestion Criteria of FAA Advisory Circular AC 33-1B.

NOTE 13 Engine equipment, which is aircraft mounted, includes two water-alcohol injection nozzles for the 250-B17C (optional)

NOTE 14 Operation with water-alcohol injection is limited to ambient temperatures above 4.44^{o}C (40°F). The augmented takeoff rating is based on a water-alcohol flow rate of 1.25 gpm delivered to the injection nozzles at a pressure differential of 50 psi across each nozzle. The water-alcohol solution, nozzle location and system installation must be in accordance with the FAA approved installation Design Handbook requirements.

NOTE 15 A magnetic oil drain plug (chip detector) indicator lamp is an installation requirement.

NOTE 16 A 3 to 25 micron absolute external seavenge oil filter is an installation requirement for the model 250- F/2 engine.

NOTE 17 Control system component part numbers approved for each engine model are listed in the applicable parts catalog.

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