

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E10CE	
Revision 14	
ALLISON	
250-B15A	250-B17D
250-B15E	250-B17E
250-B15G	250-B17F
250-B17	250-B17F/1
250-B17B	250-B17F/2
250-B17C	
October 31, 1994	

TYPE CERTIFICATE DATA SHEET NO. E10CE

Engines of models described herein conforming with this data sheet (which is part of Type Certificate No. E10CE), 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 Holder	Allison Engine Company P.O. Box 420 Indianapolis, Indiana 46206-0420
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Model	250-B15A, -B15E, -B15G	250-B17	250-B17B	250-B17C
Type	Free turbine - turboprop; Axial centrifugal compressor, 2 stage gas producer turbine, 2 stage power turbine, single combustion chamber			
Prop drive ratio	17.284:1	16.399:1	--	--
Ratings (see NOTE 3)				
Max. continuous				
s.hp. at sea level	270	385	--	420
Prop drive r.p.m.	2025	2030	--	--
Measured gas temp.	1280°F (693°C)	1430°F (777°C)	1406°F (763°C)	1464°F (795°C)
Takeoff s. hp.	317	400	--	420
5 min. at sea level				
Prop drive r.p.m.	2025	2030	--	--
Measured gas temp.	1380°F (749°C)	1460°F (793°C)	1445°F (785°C)	1464°F (795°C)
Takeoff (augmented)				
at sea level, 95°F				
ambient temperature				
s.hp., 5 min.	—	—	—	420
Prop drive r.p.m.	—	—	—	2030
Measured gas temp	—	—	—	1490°F (810°C)
(see NOTE 15)				
Prop drive	Flange 4" bolt circle	--	--	--
Control system				
(see NOTE 18)	Bendix gas producer fuel control DP-M1; Woodward combination power turbine and propeller governor control 8210-010; Woodward propeller overspeed governor 8210-011	Bendix gas producer fuel control DP-P1; Woodward combination power turbine and propeller governor control 8210-018; Woodward propeller overspeed governor 8210-011	Bendix gas producer fuel control DP-P2; Woodward combination power turbine and propeller governor control 8210-018; Woodward propeller overspeed governor 8210-011	--

"- -" indicates same as preceding model.

"—" indicates not applicable.

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Model	250-B17D	250-B17E	250-B17F, -B17F/1, -B17F/2		
Type	Free turbine - turboprop; Axial centrifugal compressor, 2 stage gas producer turbine, 2 stage power turbine, single combustion chamber				
Prop drive ratio	16.399:1	--	--		
Ratings (see NOTE 3)					
Max. continuous s.hp. at sea level	420	--	450		
Prop drive r.p.m.	2030	--	--		
Measured gas temp.	1464°F (795°C)	1448°F (787°C)	1430°F (777°C)		
Takeoff s. hp.	420	--	450		
5 min. at sea level					
Prop drive r.p.m.	2030	--	--		
Measured gas temp.	1464°F (795°C)	1448°F (787°C)	1430°F (777°C)		
Takeoff (augmented) at sea level, 95°F ambient temperature					
s.hp., 5 min.	—	420	—		
Prop drive r.p.m.	—	2030	—		
Measured gas temp (see NOTE 15)	—	1490°F (810°C)	—		
Prop drive	Flange 4" bolt circle	--	--		
Control system (see NOTE 18)	Bendix gas producer fuel control DP-P2; Woodward combination power turbine and propeller governor control 8210-018; Woodward propeller overspeed governor 8210-011	--	Bendix gas producer fuel control DP-P2; Woodward combination power turbine and propeller governor control 8210-011; Woodward propeller overspeed governor 8210-085		
Model	250-B15A, -B15E, -B15G	250-B17, -B17B	250-B17C, -B17D, -B17E	250-B17F, B17F/2	250-B17F/1
Fuel pump and filter	Sundstrand single element 024918 or 5002395 or TRW pump model 386500 (All models)				
Fuel	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.) (All models)				
Lubricating oil	MIL-L-7808G or MIL-L-23699 and subsequent revisions. (All models)				
Principal dimensions:					
Length, overall, in.	44.642	44.834	44.92	44.924	--
Width, in.	19.06	19.006	18.78	18.784	--
Height, in.	22.53	22.53	22.60	22.596	--
C.G. Location, aft of gear box side mount centerline, in.	2.72	2.70	--	2.54	2.48
Lateral C.G.	0.36 to right of gear box centerline (looking fwd.- in.)	0.26 to left of engine centerline (looking fwd. - in.)	--	0.42 (text) of - -	.32 (text) of - -
C.G. Vertical - above engine centerline (see NOTE 10)	2.72	3.13	--	2.68	--

Model (cont'd)	250-B15A, -B15E, -B15G	250-B17, -B17B	250-B17C, -B17D, -B17E	250-B17F, B17F/2	250-B17F/1
Weight (dry), lb.	250-B15A 171	195	--	212	215
Includes basic engine fuel pump and filter, ignition and fuel control system	250-B15E 171 250-B15G 180				
Ignition system	Capacitor discharge, low tension exciter type Simmons Precision (GLA) P/N 41820 or P/N 43765 Bendix Scintilla P/N 10-369950-2 or P/N 10-374440-1 Champion spark igniter P/N FHE 161 or AC P/N 5611071 (Type YB 63) (AC P/N 5611588) or Auburn P/N 0270486	Capacitor discharge, low tension exciter type Simmonds Precision (GLA) P/N 43754 or P/N 49522 Bendix-Scintilla P/N 10-387150 1 Champion spark igniter 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	--	--	--

"- -" indicates same as preceding model.

"—" indicates does not apply.

Certification basis 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 for Type Certificate dated June 12, 1967. Type Certificate No. E10CE issued March 27, 1969, for Model 250-B15A, 250-B15E, and 250-B15G. Model 250-B17 added April 7, 1971. Model 250-B17B added July 5, 1974. Model 250-B17C added May 11, 1979. Model 250-B17D added November 14, 1983. Model 250-B17E added May 17, 1985. Model 250-B17F dated May 6, 1988.

Production basis Production Certificate No. 310.

NOTE 1. Maximum Permissible Temperature:

Measured Gas Temperatures

Takeoff 1490°F. (810°C.) for Models 250-B17B, -B17C, -B17D, -B17E, and -B17F, F/1, F/2
1380°F. (749°C.) for Model 250-B15G
1460°F. (793°C.) for Model 250-B17

Maximum continuous 1280°F. (693°C.) for Model 250-B15G
1430°F. (777°C.) for Model 250-B17
1490°F. (810°C.) for Models 250-B17B, -B17C, -B17D, -B17E, and -B17F, F/1, F/2

**Maximum transient
(not to exceed
6 seconds)** 1550°F. (843°C.) for Models 250-B15G, 250-B17, -B17B, -B17C, -B17D, -B17E, 250-
B17F, F/1, F/2. Ten seconds maximum between 1380°F. (749°C.) to 1700°F.
250-B17D, and 250-B17E. Ten seconds maximum between 1380°F. (749°C.) to
1700°F. (927°C.) for Model 250-B15G, ten seconds maximum between 1460°F.
(793°C.) to 1700°F. (927°C.) for Model 250-B17 and ten seconds maximum between
1490°F. (810°C.) to 1700°F. (927°C.) for Models 250-B17B, -B17C, -B17D, -B17E,
and -B17F, F/1, F/2.

**Maximum transient
(6 not to exceed
12 seconds)** 1490°F. (810°C.) to 1650°F. (899°C.) for Model 250-B17F/1
(maximum of three occurrences per life of each turbine wheel).

Oil inlet temperatures Minus 65°F. to 180°F. for MIL-L-7808 and minus 40°F. to 180°F. for MIL-L-23699 for
Models 250-B15G, 250-B17, 250-B17B, -B17C, -B17E, and 250-B17F, F/1, F/2.
Temperatures up to 225°F. are permitted for the 250-B17, -B17B, -B17C, -B17D, -B17E,
and -B17F, F/1, F/2 when operating at powers not in excess of 165 hp. Temperatures up
to 225°F. are allowed for five minutes when operating at powers in excess of 165 hp. for
models 250-B17, -B17B, -B17D, -B17E, and -B17F, F/1, F/2.

Note 2. Fuel inlet and oil pressure limits are as follows:

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 in. Hg at sea level, ambient minus 5.5 in. Hg at 6000 feet, ambient minus 3.3 in. Hg at 10,000 feet, ambient minus 0.8 in. Hg at 15,000 feet, ambient plus 1.5 in. Hg at 20,000 feet, ambient plus 3.0 in. Hg at 25,000 feet. No fuel inlet depression permitted with MIL-G-5572 fuel. Maximum pressure 25 p.s.i.g.

Oil: Model 250-B15 Series:

Operating oil gauge pressure at 48,053 r.p.m. (94.0 percent) gas producer speed and above is 110 to 130 p.s.i.g.

43,452 r.p.m. (85.0 percent) to 48,053 r.p.m. gas producer speed, 90 to 130 p.s.i.g.

Below 43,452 r.p.m. gas producer speed 50 to 130 p.s.i.g.

Oil pump inlet pressure 5 in. Hg absolute minimum when operating in the Beta range (propeller operating below selected governor r.p.m.), the above minimum oil pressure limits are reduced by 15 p.s.i.g.

Models 250-B17, 250-B17B, 250-B17C, 250-B17D, 250-B17E, and 250-B17F, F/1, F/2:

Operating oil gauge pressure at 47,912 r.p.m. (94.0 percent) gas producer speed and above is 110 to 130 p.s.i.g. for all models except -B17F, 1, 2, which is 120-130 p.s.i.g.

43,325 r.p.m. (85.0 percent) to 47,912 r.p.m. gas producer speed is 90 to 130 p.s.i.g.

Below 43,325 r.p.m. gas producer speed 50 to 130 p.s.i.g.

Oil pump inlet pressure 5 in. Hg absolute minimum
When operating in the Beta range (propeller operating below selected governor r.p.m.), the above minimum oil pressure limits are reduced by 15 p.s.i.g.

NOTE 3. The engine ratings, unless otherwise specified, are based on static sea level standard conditions. Compressor inlet air (dry) 59°F., 29.92 in. Hg. 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 4. The following accessory drive or mounting provisions are available:
(Models 250-B15G, 250-B17, 250-B17B, 250-B17C, 250-B17D, 250-B17E, and 250-B17F)

Driven by Gas Producer Turbine	*Direction or Rotation	Speed Ratio to Turbine	Max. Torque (in. -lb.)		Maximum Overhang Moment (in. lb.)
			Continuous	Static	
Spare	C	0.0728	35	75	25
Tachometer	CC	0.0824	7	50	4
Starter-Generator	C	0.2361	**	550	94
<u>Driven by Power Turbine</u>					
***Power takeoff-rear	C	0.1807	4611	8000	100
Tachometer	CC	0.1197	7	50	4
		(250-B15)			
		0.1262			
		(250-B17, B17B, C, D, E, F, F/1, F/2)			

*C - Clockwise viewed drive pad; CC- Counterclockwise.

**The maximum generator load is 150 amperes (9.3 hp.).

***Not provided on 250-B15G. 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 above table represent the 5 minute and maximum continuous limited total torque.

- NOTE 5. External air bleed may not exceed 4.0 percent for the 250-B15G and 4.5% for the 250-B17, -B17B, -B17C, -B17D, -B17F, and -B17F, F/1, F/2.
- NOTE 6. Model 250-B15 Series:
The maximum allowable torque as measured by the torquemeter for below standard inlet air temperature and/or ram conditions is 948 ft.-lb. for 10 seconds; 869 ft.-lb. for takeoff and 737 ft.-lb. for maximum continuous.
- Models 250-B17 and -B17B:
The maximum allowable torque as measured by the torquemeter for below standards inlet air temperature and/or ram conditions is 1165 lb.-ft. for 10 seconds; 1087 lb.-ft. for takeoff and 996 lb.-ft. for maximum continuous.
- Models 250-B17C, -B17D, and -B17E:
The maximum allowable torque as measured by the torquemeter for below standard inlet air temperature and/or ram conditions is 1165 lb.-ft. for 10 seconds; 1138 lb.-ft. for takeoff and maximum continuous.
- Model 250-B17F, -B17F/1, and -B17F/2
The maximum allowable torque as measured by the torquemeter for below standard inlet air temperature and/or ram conditions is 1218 lb.-ft. for 10 seconds; 1185 lb.-ft. for takeoff and maximum continuous.
- NOTE 7. Gas producer speeds up to 105 percent are permissible for 15 seconds and up to 104 percent speed continuously for the 250-B15 and 250-B17, and up to 106 percent for 15 seconds and up to 105 percent speed continuously for the 250-B17B, -B17C, -B17D, -B17E and -B17F, F/1, F/2. Power turbine speeds up to 110 percent are permissible for 15 seconds and up to 104 percent continuously for 250-B15 and 105 percent for 250-B17, -B17B, -B17C, -B17D, -B17E and -B17F, F/1, F/2. The power turbine governor provides propeller overspeed protection. 100 percent gas producer speed is defined as 51,120 r.p.m. for 250-B15, and 50,970 r.p.m. for 250-B17, -B17B, -B17C, -B17D, -B17E, and -B17F, F/1, F/2. 100 percent turbine speed is defined as 35,000 r.p.m. for the 250-B15 and 33,290 for the 250-B17, -B17B, -B17C, -B17D, -B17E, and -B17F, F/1, F/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-B15A is similar to the 250-B15G except no provision for coordinator.
The 250-B15E is similar to the 250-B15G except no provision for coordinator and propeller brake.
The 250-B17 is similar to the 250-B15G except increased ratings, larger diameter first stage compressor wheel and larger diameter power turbine wheels.
The 250-B17B is similar to 250-B17 except for turbine changes for improved hot day performance.
The 250-B17C is similar to 250-B17B except for increased ratings and deleted propeller brake.
The 250-B17D is similar to 250-B17C except for propeller reduction gearbox changes to accommodate aerobatic maneuvers.
The 250-B17E is similar to 250-B17C except the guaranteed performance ratings are accomplished at reduced rated measured gas temperatures.
The 250-B17F is similar to the 250-B17D except for increased performance, a new compressor, and incorporates an on-speed #1 wheel internal energy absorbing ring.
The 250-B17F/1 is similar to the 250-B17F except it incorporates an electronic power turbine (N2) overspeed detection system and it does not incorporate propeller reduction gearbox changes to accommodate aerobatic maneuvers.
The 250-B17F/2 is similar to the 250-B17F except it does not incorporate propeller reduction gearbox changes to accommodate aerobatic maneuvers.
- NOTE 10. For the 250-B15A and 250-B15E models the CG location aft of gear box side mount centerline moves to 2.74 in. The lateral CG moves to 1.01 inches to the right of gear box centerline (looking forward) and the vertical CG moves to 2.96 inches above the engine centerline.
- NOTE 11. These engines are approved for both tractor and pusher applications.

- NOTE 12. 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 13. Engines produced under this type certificate except the model 250-B17F, are approved for operation with unprotected inlets having been tested in accordance with Group I and Group II Foreign Object Ingestion Criteria of FAA Advisory Circular AC 33-1B. The model 250-B17F is approved for operation with an unprotected inlet having been tested in accordance with Foreign Object Ingestion Criteria of FAR 33-10, Section 33.77 with the exception that Advisory Circular 20-73 criteria of 60-second delay, instead of 2-minutes, was used in actuating the anti-icing system.
- NOTE 14. Engine equipment, which is aircraft mounted, includes two water-alcohol injection nozzles for the 250-B17C (optional) and 250-B17E (optional).
- NOTE 15. Operation with water-alcohol injection is limited to ambient temperatures above 40°F. The augmented takeoff rating is based on water-alcohol flow rate of 1.25 g.p.m. delivered to the injection nozzles at a pressure differential of 50 p.s.i. 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 16. A magnetic oil drain plug (chip detector) indicator lamp is an installation requirement.
- NOTE 17. A 3 to 25 micron absolute external scavenge oil filter is an installation requirement for the model 250-B17F, F/1, F/2 engines.
- NOTE 18. Control system component part numbers approved for each engine mode are listed in the applicable parts catalog.

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