

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

E4CE	
Revision 36	
ALLISON	
250-C10	250-C20F
250-C10B	250-C20J
250-C10D	250-C20S
250-C18	250-C20R
250-C18A	250-C20R/1
250-C18B	250-C20R/2
250-C18C	250-C20R/4
250-C19	250-C20W
250-C20	225-C10
250-C20B	225-C10A
250-C20C	
July 1, 1999	

TYPE CERTIFICATE DATA SHEET NO. E4CE

Engines of models described herein conforming with this data sheet, (which is part of Type Certificate No. E4CE) 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

Model	250-C10B, 250-C10D, 250-C18, 250-C18A, 250-C19						250-C18B, 250-C18C		250-C20	250-C20B	250-C20C
Type	Free turbine turboshaft axial centrifugal compressor, 2 stage gas producer & 2 stage power turbine, Single combustion chamber										
Shaft ratio	5.83:1	--	--	--	--	--	--	5.53:1	--	--	--
Ratings (see Note 3)											
Max continuous shp at sea level	212	270	--	--	--	--	--	385	420	370	--
Gas producer rpm (est.)	47350	49760	--	--	--	--	--	51490	53000	51200	--
Output shaft rpm	6000	--	--	--	--	--	--	6016	--	--	--
Measured gas temp.	1165°F (630°C)	1280°F (693°C)	--	--	--	--	--	1430°F (777°C)	1490°F (810°C)	1360°F (738°C)	--
Takeoff											
shp 5 min. at sea level	250	317	--	--	--	--	--	400	420	--	--
Gas producer rpm (est.)	48950	51600	--	--	--	--	--	52000	53000	--	--
Output shaft rpm	6000	--	--	--	--	--	--	6016	--	--	--
Measured gas temp.	1240°F (671°C)	1380°F (749°C)	--	--	--	--	--	1460°F (793°C)	1490°F (810°C)	--	--
Takeoff (augmented) at sea level, 95°F ambient temperature											
shp, 5 min.	--	--	--	--	310	--	--	--	420	--	--
Output shaft rpm	--	--	--	--	6000	--	--	--	6016	--	--
Measured gas temp. (see Note 14)	--	--	--	--	1380°F (749°C)	--	--	--	1490°F (810°C)	--	--

"- -" indicates "same as preceding model."

"—" indicates "not applicable."

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Model (cont'd)	250-C10	250-C10B, 250-C10D, 250-C18, 250-C18A, 250-C19	250-C18B, 250-C18C	250-C20	250-C20B	250-C20C
30 minute power at sea level shp	250	317	--	400	420	—
Gas producer rpm (est.)	48950	51600	--	52000	53000	—
Output shaft rpm	6000	--	--	6016	--	—
Measured gas temp	1240°F (671°C)	1380°F (749°C)	--	1460°F (793°C)	1490°F (810°C)	—
Output shaft	Internal spline	--	--	--	--	--
Control system						
Bendix gas producer fuel control	DP-D3	--	--	DP-N1 or DP-N2	DP-N2	--
Bendix power turbine governor	AL-L2	AL-L2 or AL-L3	--	AL-AA1	--	--
Chandler Evans fuel control system	—	—	—	MC-40	--	—
Bendix ambient temp compensator	TS-D3	—	—	—	—	—
Bendix pneumatic accumulator (see NOTE 10)	--	--	--	--	--	--
Fuel pump and filter	Pesco Mdl 023835	Sundstrand Models 024918 or 5002395 except 250-C10D or TRW Model 386500 except 250-C10D or Pesco Model 024731	--	--	--	Sundstrand Models 024918 or 5002395 or TRW Model 386500
Fuel	MIL-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels per ASTM D1655, Jet A or A-1 (or Allison Spec. EMS-64) or Jet B; MIL-T-83133, Grade JP-8; JP-1 or Diesel #1 fuel conforming to ASTM D-1655, Jet A; Artic Diesel Fuel DF-A (W-F-800B) conforming to ASTM D-1655, Jet A or Jet A1; (for other fuel and limitations see Note 9)					
Lubricating oil	MIL-L-7808F or MIL-L-23699 and subsequent revisions	--	--	--	--	--
Principal dimensions						
Length overall, in.	40.478	40.4	--	40.81	--	--
Width, in.	19.006	19	--	19.01	--	--
Height, in.	22.5	22.5	--	23.20	--	--
C.G. location, aft of side mount pad centerline, in.	5.23	5.08	--	5.48	--	--
C.G. location, above pad centerline, in. (*below)	0.2	--	--	0.88	--	--
C.G. location, right of engine centerline (*left)	0	--	--	--	--	--

Model (cont'd)	250-C10	250-C10B, 250-C10D, 250-C18, 250-C18A, 250-C19	250-C18B, 250-C18C	250-C20	250-C20B	250-C20C
Weight (dry), lb. Includes basic engine, fuel pump and filter, ignition and fuel control system, (with #1 turbine wheel internal energy absorbing ring).	136  (—)	250-C10D, 139 lbs. 250-C10B, 138.7 lbs 250-C18, C18A, 141 lb. 250-C19, 144 lb.  (—)	141.2  (—)	158  (—)	--  (161)	--  (—)
Ignition system (see Note 12)	Capacitor discharge, low tension exciter type. Scintilla Div., Bendix Corp. TCN or Simmonds Precision (GLA) Champion spark igniter P/N FHE 161	Capacitor discharge low tension exciter type. Simmonds Precision (GLA) P/N 41820, P/N 43754, or P/N 49522 Bendix- Scintilla P/N 10- 369950-2, P/N 10- 374440-1 or P/N 10- 387150-1  Champion spark igniter P/N FHE 161, or CH 34168, AC P/N 5611588. (Type YB 63-1) or AC P/N 5611071 (Type YB 63) or Auburn P/N 0270486	--  --	--  --	--  --	--  --
Auto Reignition Control (Optional - see Note 15)	—	P/N 6877740(-C10D), P/N 6877138(-C18) P/N 68771389(-C18B)	--	P/N 6877142	P/N 6892079 or P/N 6877142	—
Compressor bleed valve	—	Holley A45411 or A45413A or Allison P/N 6874979	--	Allison P/N 6875120 or 6889815 or 6896348 or 6894115	--	--

"- -" indicates "same as preceding model."

"—" indicates "not applicable."

Model	250-C20R					
	250-C20F	250-C20J	250-C20S	250-C20R/1 250-C20R/2 250-C20R/4	225-C10 225-C10A	250-C20W
Type	Free turbine turboshaft, axial centrifugal compressor, 2 stage gas producer & 2 stage power turbine, Single combustion chamber					
Shaft ratio	5.53:1	--	--	--	--	--
Ratings (see Note 3)						
Max continuous shp at sea level	420	--	--	450	350	420
Gas producer rpm(est.)	51790	53000	--	50537	49985	51790
Output shaft rpm	6016	--	--	--	--	--
Measured gas temp.	1490°F (810°C)	--	--	1423°F (773°C)	1324°F (718°C)	1490°F (810°C)
Takeoff shp 5 min. at sea level	420	--	--	450	350	420
Gas producer rpm(est.)	51790	53000	--	50537	49985	51790
Output shaft rpm	6016	--	--	--	--	--
Measured gas temp.	1490°F (810°C)	--	--	1423°F (773°C)	1324°F (718°C)	1490°F (810°C)
Takeoff (augmented) at sea level, 95°F ambient temperature shp, 5 min.	420	--	--	—	—	—
Output shaft rpm	6016	--	--	—	—	—
Measured gas temp. (see Note 14)	1490°F (810°C)	--	--	—	—	—
30 minute OEI power at sea level shp	420	--	—	450	350	420
Gas producer rpm(est.)	51790	53000	—	50537	49985	51790
Output shaft rpm	6016	--	—	6016	6016	--
Measured gas temp	1490°F (810°C)	--	—	1490°F (810°C)	1324°F (718°C)	1490°F (810°C)
Output shaft	Internal spline	--	--	--	--	--
Control system						
Bendix gas producer fuel control	DP-N2	--	DP-P2	DP-N2	--	--
Bendix power turbine governor	AL-AA1	--	--	--	--	--
Chandler Evan fuel control system	—	—	—	—	—	—
Bendix ambient temp compensator	—	—	—	—	—	—
Bendix pneumatic accumulator (see NOTE 10)	--	--	—	--	--	--
Fuel pump and filter	Sundstrand Models 024918 or 5002395 or TRW Model 386500	--	--	Sundstrand Models 024918 or 5001294 or TRW Model 386500, except 250-C20R/2 P/N 23053265 engine incorporates CECO Model MFP 262	Sundstrand Models 024918 or 5002395 or TRW Model 386500	--

Model (cont'd)	250-C20R					
	250-C20F	250-C20J	250-C20S	250-C20R/1 250-C20R/2 250-C20R/4	225-C10 225-C10A	250-C20W
Fuel	MIL-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels per ASTM D1655, Jet A or A-1 (or Allison Spec. EMS-64) or Jet B; MIL-T-83133, Grade JP-8; JP-1 or Diesel #1 fuel conforming to ASTM D-1655, Jet A; Artic Diesel Fuel DF-A (W-F-800B) conforming to ASTM D-1655, Jet A or Jet A1; (for other fuel and limitations see Note 9)					
Lubricating oil	MIL-L-7808F or MIL-L-23699 and subsequent revisions					
Principal dimensions	--	--	--	--	--	--
Length overall, in.	40.81	--	40.756	40.856	40.81	40.756
Width, in.	19.01	--	18.784	20.76	19.01	18.784
Height, in.	23.20	--	22.596	23.196	23.20	22.596
C.G. location, aft of side mount pad centerline, in.	5.07	5.14	5.10	4.88, 4.72, 4.66, 4.66	5.48	5.31
C.G. location, above pad centerline, in. (*below)	0.63	--	0.71*	.60, .75, .75, .75	0.88	0.77*
C.G. location, right of engine centerline (*left)	0.03	0.04	0.09*	.05, .01, .18, .18	0.01	0.08*
Weight (dry), lb. Includes basic engine, fuel pump and filter, ignition and fuel control system, (with #1 turbine wheel internal energy absorbing ring).	158  (161)	--  --	159  (162)	—  (173, 173, 169, 169)	—  (161)	—  (162)
Ignition system (see Note 12)	Capacitor discharge Low tension exciter type. Simmonds Precision (GLA) P/N 41820, P/N 43754, or P/N 49522 Bendix-Scintilla P/N 10-369950-2, P/N 10-374440-1 or P/N 10-387150-1					
	Champion spark igniter P/N FHE 161, or CH 34168, AC P/N 5611588. (Type YB 63-1) or AC P/N 5611071 (Type YB 63) or Auburn P/N 0270486					
Auto Reignition Control (Optional - see Note 15)	—	P/N 6892079 or P/N 6877142	—	—	—	—
Compressor bleed valve	Allison P/N 6875120 or 6889815 or 6896348 or 6894115	--	--	Allison P/N 23039173, P/N 23038951	Allison P/N 23007879	Allison P/N 23036665

Certification basis Part 13 of the Civil Air Regulations effective June 15, 1956, as amended by 13-1, 13-2 and 13-3, and Exemption No. 219A from CAR 13.211, Regulatory Docket 1337 issued August 6, 1962, and amended May 12, 1980. Application for Type Certificate dated September 15, 1961. Type Certificate No. E4CE issued December 19, 1962, for Model 250-C10; Models 250-C10B, and 250-C18 and 250-C18A added September 9, 1965; Models 250-C18B and 250-C18C added September 25, 1967; Models 250-C19 added April 29, 1968; Model 250-C10D added November 15, 1968; Model 250-C20 added April 22, 1970; Model 250-C20B added February 28, 1974; Model 250-C20C added June 9, 1976; Model 250-C20F added March 2, 1979; Model 250-C20J added September 15, 1981; Model 250-C20S added December 30, 1983; Model 250-C20R/1 added September 12, 1986; Model 250-C20R/2 added March 5, 1987; Model 225-C10 and 225-C10A added March 20, 1987; Model 250-C20R added September 29, 1989; Model 250-C20R/4 added December 5, 1989; Model 250-C20W added April 20, 1990.

Production Basis Production Certificate No. 310

NOTE 1. Maximum permissible temperatures:

Measured gas temperatures:

Takeoff and 30 minutes

power

1360°F (738°C) for Model 250-C10  
 1400°F (760°C) for Models 250-C10 and -C10A  
 1460°F (793°C) for Model 250-C20  
 1490°F (810°C) for Models 250-C20B, 250-C20C, 250-C20F, 250-C20J,  
 250-C20S, 250-C20R, 250-C20R/1,2,4, and 250-C20W, and  
 1380°F (749°C) for all other models.

Maximum continuous

1400°F (760°C) for Models 225-C10 and -C10A  
 1430°F (777°C) for Model 250-C20  
 1490°F (810°C) for Models 250-C20B, 250-C20F, 250-C20J, 250-C20S,  
 250-C20R, 250-C20R/1,2,4, and 250-C20W  
 1360°F (738°C) for Model 250-C20C and 1280° (693°C) for all other models.

Maximum transient  
 (not to exceed  
 6 seconds)

1360°F (738°C) to 1550°F (843°C) for Model 250-C10  
 1400°F (760°C) to 1550°F (843°C) for Model 250-C10, -C10A  
 1460°F (793°C) to 1550°F (843°C) for Model 250-C20  
 1490°F (810°C) to 1550°F (843°C) for Models 250-C20B, 250-C20C, 250-C20F,  
 250-C20J, 250-C20S, and 250-C20W  
 1490°F (810°C) to 1650° (899°C) for Model 250-C20R Series and 1380°F (749°C)  
 to 1550°F (843°C) for all other models.

Maximum transient  
 (from 6 not to  
 exceed a maximum  
 of 12 seconds)

1490°F (810°C) to 1650°F (899°C) for Model 250-C20B, 250-C20F, 250-C20J,  
 250-C20R, 250-C20R/1,2,4 and 250-C20W (maximum of three occurrences per life  
 of each turbine wheel).

Starting

Six seconds maximum at 1360°F (738°C) to 1700°F (927°C) for Model 250-C10;  
 ten seconds maximum at 1460°F (793°C) to 1700°F (927°C) for Model 250-C20,  
 1490°F (810°C) to 1700°F (927°C) for Models 250-C20B, 250-C20C, 250-C20F,  
 250-C20J, 250-C20S, 250-C20R, 250-C20R/1,2,4, 250-C20W, 225-C10 & -C10A,  
 and 1380°F (749°C) to 1700°F (927°C) for all other models. For all engine models,  
 the maximum allowable temperature during starting, 1700°F (927°C), is limited  
 to a momentary peak of one second maximum.

Oil inlet temperatures

Minus 65°F (-54°C) to 200°F (93°C) for Model 250-C10 and minus 65°F (-54°C)  
 to 225°F (107°C) for all other models for MIL-L-7808F type oil. Minus  
 40°C (-40°F) to 225°F (107°C) for all models using MIL-L-23699 type oil.

## NOTE 2. Fuel inlet and oil pressure limits:

## Fuel:

250-C10

(Applicable to MIL-T-5624 and ASTM-D1655 Jet A or A-1 fuels), minimum at fuel connection to engine: Not less than ambient pressure minus 7 in. Hg at sea level and ambient pressure minus 5.5 in. Hg at 6000 ft. altitude; maximum pressure 25 p.s.i.g.

250-C18 250-C20F  
 250-C18A 250-C20J  
 250-C18B 250-C20S  
 250-C18C 250-C20R  
 250-C19 250-C20R/1/2/4  
 250-C20 250-C20W  
 250-C20B 225-C10  
 250-C20C 225-C10A

(Applicable to MIL-T-5624 and ASTM-D1655 Jet A or A-1 fuels), minimum at fuel connection to engine: Not less than ambient pressure minus 9 in. Hg at sea level; ambient minus 5.5 in. Hg. at 6000 ft.; ambient minus 3.3 in. Hg. at 10,000 ft.; ambient minus 0.8 in. Hg at 15,000 ft.; ambient plus 1.5 in. Hg at 20,000 ft. altitude, and ambient plus 3.0 in. Hg at 25,000 ft. Maximum pressure 25 p.s.i.g. No fuel inlet depression permitted with MIL-G-5572 fuel. Fuel pressure requirement is different for Model 250-C20R/2 P/N 23053265 engine (P/N 23053267 Installation Assembly). See Installation Design Manual.

## Oil:

Model 250-C10 and 250-C18 Series:

Operating oil gauge pressure at 49,586 r.p.m. (97.0%) gas producer speed and above: 110 to 130 p.s.i.g.

39,874 r.p.m. (78.0%) to 49,586 r.p.m. gas producer speed: 90 to 130 p.s.i.g.

Below 39,874 r.p.m. gas producer speed: 50 to 130 p.s.i.g.

Model 250-C20 Series:

Operating oil gauge pressure at 48,014 r.p.m. (94.2%) gas producer speed and above: 115 to 130 p.s.i.g. all models except -C20R, -C210R/1,2,4 which is 120-130 p.s.i.g.

40,011 r.p.m. (78.5%) to 48,014 r.p.m. (94.2%) gas producer speed: 90 to 130 p.s.i.g.

Below 40,011 r.p.m. gas producer speed 50 to 130 p.s.i.g.

Oil pump inlet pressure 5 in. Hg absolute minimum (250-C20R series, a 10% aeration by volume permitted in oil from primed pump and lower pressure limit declines at the rate of 2 p.s.i.g. per 1,000 feet at altitudes above 5,000 feet, to a maximum reduction of 20 p.s.i.g.)

Model 225-C10 Series:

Operating oil gauge pressure at 48,014 r.p.m. (94.2%) gas producer speed and above: 115 to 130 p.s.i.g.

40,011 r.p.m. (78.5%) to 48,014 r.p.m. (94.2%) gas producer speed: 90 to 130 p.s.i.g.

Below 40,011 r.p.m. (78.5%) gas producer speed: 50 to 130 p.s.i.g.

Oil pump inlet pressure 5 in. Hg absolute minimum.

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 load and no air bleed. Measured rated gas temperature as indicated by average of the 4 gas temperature thermocouples. Certain models are intended for military uses only. The power ratings for these models have been redesignated by the military, but are equivalent to the ratings listed herein.

NOTE 4. The following accessory drive or mounting provisions are available:

Driven by Gas Producer Turbine	*Direction of Rotation	Speed Ratio to Turbine	Max. Torque (in.-lb.)		Maximum Overhang Moment (in.-lb.)
			Condition	Static	
Spare (except optional on -C20B, -C20F, J, 225-C10, A, none on -C20R & -C20R/1,2,4, -C20W)	C	0.0728	35 (-C20 Series) 17 (all others)	75	25 (30 for -C20B,F,J,S, 225-C10 & -C10A)
Tachometer	CC	0.0824	7	50	4
Starter-Generator	C	0.2361	**	350(C-10) 550 (all others)	94
<b>Driven by Power Turbine</b>					
Power Takeoff-Rear	C (-C20 Series) (225-C10, -C10A)	0.1714	525 (-C10)	8000	100
		0.1807	***4416 (-C20)		
		0.1807	***4608 (-C20B, C,F,J, S, & W)		
			***4800 (-C20R & -C20R/1,2,4)		
			***3672 (225-C10, -C10A) ***3516 (all others)		
Tachometer	CC	0.1262 (-C20 Series) 0.1197 (all others)	7	50	4

\*C - Clockwise viewing drive pad, CC- Counterclockwise

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

\*\*\* - The sum of the torque extracted in any combination from the front and rear power output drives shall not exceed the torque values specifies in Note 7. The values given in the above table represent the 30 minute limited maximum total torque (Maximum Continuous for -C20S).

NOTE 5. External air bleed may not exceed 3 percent for the 250-C10 and 4.5 percent for all other models.

NOTE 6. Engine equipment, which is aircraft mounted, includes the ambient temperature compensator for the 250-C10 only; two water injection nozzles for the 250-C18B, 250-C18C, 250-C20B (Optional), 250-C20F (Optional), 250-C20J (Optional), 250-C20S (Optional); and the electronic power turbine overspeed (N2) protection system for the Model 250-C20R & C20R/1.

NOTE 7. The maximum allowable torque limits as measured by the torquemeter for below standard inlet air temperature and/or ram conditions are as follows:

Model 250-C10 Series:

300 lb.-ft. for 3 seconds, 250 lb.-ft. for 10 seconds, 240 lb.-ft. for takeoff and 30 min. power, and 204 lb.-ft. for maximum continuous power.

Model 250-C18 Series:

320 lb.-ft. for 10 seconds, 293 lb.-ft. for takeoff and 30 min. power, and 249 lb.-ft. for maximum continuous power.

Model 250-C20:

393 lb.-ft. for 10 seconds, 367 lb.-ft. for takeoff and 30 min. power, and 336 lb.-ft. for maximum continuous power.

- NOTE 7. (cont'd) Models 250-C20B, -C20F, -C20J, -C20S, and -C20W:  
430 lb.-ft. for 16 seconds (393 lb.-ft. for 10 seconds -C20S)  
384 lb.-ft. for takeoff, 30 min. power, and maximum continuous power
- Model 250-C20R & C20R/1,2,4: 490 lb.-ft. for 16 seconds, 400 lb.-ft. for takeoff, 30 min. power, and maximum continuous power.
- Model 225-C10, -C10A: 323 lb.-ft. for 10 seconds, 306 lb.-ft. for takeoff, 30 min. power, and maximum continuous power.
- NOTE 8. The maximum output shaft speed limit for momentary transients (up to 15 seconds) is from 114 percent at idle to 105 percent at takeoff for the 250-C10D, from 113 percent at idle to 105 percent at takeoff for the 250-C20, -C20B, -C20C, -C20F, -C20J, -C20R, -C20R/1,2,4, -C20W and 225-C10, -C10A, and 110 percent for the -C20S, and from 110 percent at idle to 105 percent at takeoff for all other models. The maximum output shaft speed for sustained periods is 105 percent for the -C20S. The maximum output shaft speed limit for sustained periods is from 108 percent at idle to 103 percent at takeoff for all other models. Gas producer speeds are permissible up to 102 percent for sustained periods and up to 103 percent for 15 seconds for the 250-C10, up to 105% for sustained periods and up to 106 percent for 15 seconds for the 250-C20, -C20B, -C20C, -C20F, -C20J, -C20S, -C20R and -C20R/1,2,4, -C20W and 225-C10, -C10A, and up to 104 percent for sustained periods and up to 105 percent for 15 seconds for all other models. 100 percent output shaft speed is defined as 6016 r.p.m., and 100 percent gas producer speed is defined as 50,970 r.p.m. for 250-C20 series, 225-C10, -C10A; and 100 percent output shaft speed is 6000 r.p.m. and 100 percent gas producer speed is 51,120 r.p.m. for all other models.
- NOTE 9. Emergency use of aviation gasoline MIL-G-5572, grade 115/145 and lower, is limited to the amount of fuel required to operate the engine for not over 6 hours during any 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. A mixture consisting of 1/3 volume of aviation gasoline MIL-G-5572, grade 100/130, with a maximum of 2.0 ml./gal. lead content 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 not over 300 hours during any overhaul period. 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 pico-ohms per meter. The 250-C18, 250-C20 and 250-C20R series engines are approved for use with C.I.S. Specification fuels and Romanian fuel in accordance with Commercial Service Letter 158/1154/4024.
- NOTE 10. A pneumatic accumulator(s) mounted on the engine fire shield must be selected from sizes supplied by the engine manufacturer for compatibility with the rotor system of the particular model helicopter in which the engine is to be installed, for Bendix systems. For the 250-C20R, P/N 23059597, the required pneumatic accumulators are supplied and installed for compatibility of the rotor system and the Bendix system for use on Tridair 206L series conversions (Twin). For the 250-C20R/2 P/N 23053265, the required pneumatic accumulators are supplied and installed for compatibility of the rotor system and the Bendix system for use on MDHC 500 Series helicopter .
- NOTE 11. Model 250-C10B is adapted for use in the Hughes Tool Company Model 369 (OH-6A) Helicopter. Model 250-C10D is similar to the 250-C10B and is adapted for use in the Bell Helicopter Company Model 206A-1 (OH-58A) helicopter.
- Model 250-C18 is similar to the 250-C10B and is adapted for use in Fairchild Hiller Model 1100 Helicopter and Bell Helicopter Company Models 206A and 206A-1 Helicopters.
- Model 250-C18A is similar to the 250-C18 and is adapted for use in the Hughes Tool Company Model 369H Helicopter.
- Models 250-C18B and 250-C18C are similar to Models 250-C18 and 250-C18A respectively, with provisions added for water-alcohol injection.
- Model 250-C19 is similar to Model 250-C18 except the exhaust is directed down.

NOTE 11. (cont'd) Model 250-C20 is similar to Model 250-C18 except the first stage compressor and turbine wheels are larger in diameter.

Model 250-C18B and 250-C18C can be installed in lieu of Models 250-C18 and 250-C18A, respectively, and operated dry.

Model 250-C20B is similar to Model 250-C20 except for increased performance. Provisions for water-alcohol injection are optional with the Model 250-C20B.

Model 250-C20C is similar to Model 250-C20B but has not been certificated for water-alcohol injection, and is adapted for military uses in the Bell Helicopter Company OH-58C Helicopter.

Model 250-C20F is similar to Model 250-C20B except the gearbox housing incorporates a front mounting pad and is adapted for use in the Aerospatiale AS 355 Helicopter.

Model 250-C20J is similar to Model 250-C20B except the gear-meshing frequency between the torquemeter gear and the power takeoff gear is changed from 5000 Hertz to 6000 Hertz with no change in output speed.

Model 250-C20S is similar to the 250-C20B and is adapted for exhaust down turboprop application where the airframe installation provides the propeller reduction gearbox and propeller-power turbine governor. The engine provided power turbine governor acts as an overspeed governor in addition to the installation furnished propeller governing system. The gearbox is oriented so that the output centerline is above the engine centerline. In addition, the gearbox housing incorporates a front mounting pad.

Model 250-C20R/1 is similar to the 250-C20B except for increased performance, a new compressor, and addition of an electronic power turbine (N2) overspeed protection system, and incorporates an on-speed #1 wheel internal energy absorbing ring.

Model 250-C20R is similar to the 250-C20R/1 except the gearbox housing incorporates a front mounting pad and is adopted for use in the Aerospatiale AS 355 Helicopter.

Model 250-C20R/2 is similar to the 250-C20R/1 except the electronic power turbine (N2) overspeed protection system is not included.

Model 250-C20R/4 is similar to the 250-C20R/2 except the gear meshing frequency between the torquemeter gear and the power takeoff gear is changed from 5000 Hz to 6000 Hz with no change in output speed.

Model 250-C20W is similar to the 225-C10A with the exception that the accessory gearbox spare accessory pad drive has been deleted. The 250-C20W performance rating is the same as the 250-C20F.

Model 225-C10 is similar to the Model 250-C20B with reduced MGT and Power, and incorporates an on-speed #1 turbine wheel internal energy absorbing ring.

Model 225-C10A is similar to the Model 225-C10 with the exhaust directed down. The gearbox output centerline is above the engine centerline.

There may be a number of variants of a given engine Model (distinguished by different part numbers) which incorporate minor modifications to tailor the engine for particular airframe applications.

NOTE 12. All engines produced under this type certificate have single ignition systems. Exemption No. 219B (from CAR 13.211), dated December 10, 1991, permits the type certification of the engines on this type certificate data sheet with single ignition for use in all rotorcraft, regardless of whether the rotorcraft is certificated under Part 6 or Part 7 of the CAR, or Part 27 or Part 29 of the FAR, and regardless of whether the rotorcraft is designated as Category A or Category B.

- NOTE 13. Prior to installation in certificated aircraft, any model 250 engine that has been in military service must be evaluated to ensure that it conforms to the FAA Approved Type Design, was manufactured under an approved production system, is eligible for installation on a U.S. type certificated aircraft, and is in condition for safe operation. Additionally, the following specific changes must be incorporated:
- a. Model 250-C10B engines which have been in military service must have Allison P/N 6844703-047137, 6851549 or other approved equivalent fuel line installed in place of non-fire resistant line, Allison P/N 6844703-43137.
  - b. Model 250-C10B and 250-C10D engines which have been in military service must have the Bendix Model DP-D3 gas turbine fuel control checked and adjusted in accordance with Bendix Service Bulletin GT-44.
- NOTE 14. Operation with water-alcohol injection is limited to ambient temperatures above 40°F. The augmented takeoff rating is based on a 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 Manual requirements.
- NOTE 15. The optional Auto Reignition Control Kits are approved for use only with the Simmonds Precision (GLA) P/N 43754 or 49522 or Bendix P/N 10-387150-1 ignition exciters. The P/N 6877740 Kit is adapted for use in the Bell Model 206A-1 helicopter, the P/N 6877138 Kit is adapted for use in the Bell Model 206A Helicopter, the P/N 6877142 Kit is adapted for use on the Bell Model 206B Helicopter, or the Model 206B Jet Ranger III Helicopter, and the P/N 6892079 Kit is adapted for use on the Bell Model 206L Helicopter.
- NOTE 16. Life limits established for critical rotating components are published in the corresponding Allison Engine Company Operation 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. Cracks in these wheels are not allowed in overhauled engines.
- NOTE 17. A magnetic oil drain plug (chip detector) indicator lamp is an installation requirement for 250-C20 series engines and 225-C10 series engines.
- NOTE 18. Engines produced under this type certificate, except the Models 250-C20R and C20R/1,2,4, 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 models 250-C20R & C20R/1,2,4 are approved for operation with unprotected inlets 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 19. A 3 to 25 micron absolute external scavenge oil filter is an installation requirement for the Model 250-C20R & C20R/1,2,4, Model 250-C20S, 250-C20W and 225-C10, -C10A engines.
- NOTE 20. An optional on-speed #1 turbine wheel internal energy absorbing ring is available for retrofit of the Model 250-C20B, -C20F, -C20J, and -C20S engines.
- NOTE 21. Revision 36 of this TCDS removes the references to military engine model designations. These engine models are not part of civil type certificate E4CE, and therefore are inappropriate for listing in this TCDS. However, most 250 series engines delivered to the U.S. military have been identified on the data plate with the corresponding civil model designation in addition to the military model designation. Such engines, even though delivered to the U.S. military, have either a FAR or CAR design approval and are included under the applicable type certificate. Nonetheless, the items listed in NOTE 13 of this TCDS must be addressed before these engines could be considered for installation in civil aircraft.

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