

**COMANDO DA AERONÁUTICA
DEPARTAMENTO DE PESQUISAS E DESENVOLVIMENTO
CENTRO TÉCNICO AEROESPACIAL**

TYPE CERTIFICATE DATA SHEET Nº EM-7904

Type Certificate Holder:

ROLLS-ROYCE CORPORATION
P.O. Box 420
Indianapolis, Indiana 46206-0420
USA

EM-7904-02
Sheet 01
ROLLS-ROYCE
250-C28B; 250-C28C; 250-C30; 250-C30G2; 250-C30G; 250-C30M; 250-C30S; 250-C40B; 250-C47B; 250-C47M
January 2002

Engines of models described herein conforming with this data sheet, which is part of the Type Certificate No. 7904, 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.

MODELS 250-C28B; 250-C28C; 250-C30; 250-C30M

TYPE Free turbine turboshaft, 1 stage centrifugal flow compressor, 2 stage gas producer turbine, 2 stage power turbine, single combustion chamber with pre-chamber

RATINGS	250-C28B	250-C28C	250-C30	250-C30M
(See Note 1)				
Maximum continuous:				
At sea level, kW (shp)	372.85 (500)	--	484.7 (650)	447.42 (600)
Gas producer, rpm (est.)	50 280	50 135	50 340	49 235
Output shaft, rpm	6 016	--	--	--

RATINGS (Cont.)	250-C28B	250-C28C	250-C30	250-C30M
Measured rated gas temp., °C (°F)	743 (1 370)	737 (1 359)	742 (1 368)	716 (1 320)
Takeoff:				
5 min. at sea level, kW (shp)	372.85 (500)	--	484.7 (650)	--
Gas producer, rpm	50 280	50 135	50 340	50 110
Output shaft, rpm	6 016	--	--	6 016
Measured rated gas temp., °C (°F)	743 (1 370)	737 (1 359)	742 (1 368)	--
30 minute OEI power				
At sea level, kW (shp)	372.85 (500)	--	484.7 (650)	#
Gas producer, rpm	50 280	50 135	50 340	#
Output shaft, rpm	6 016	--	--	#
Measured rated gas temp., °C (°F)	743 (1 370)	737 (1 359)	742 (1 368)	#
2 ½ minute OEI power				
At sea level, kW (shp)	410.14 (550)	--	521.99 (700)	#
Gas producer, rpm	51 465	51 165	51 550	#
Output shaft, rpm	6 016	--	--	#
Measured rated gas temp., °C (°F)	774 (1 425)	776 (1 410)	773 (1 424)	#
SHAFT RATIO	5.55:1	--	5.09:1	--
OUTPUT SHAFT	Internal spline	--	--	--
CONTROL SYSTEM	Allied Signal (Bendix) gas producer fuel control:	DP-T3	--	DP-VI
	Allied Signal (Bendix) power turbine governor:	AL-AC1	--	DP-AD1
	Pneumatic accumulators and check valves or orifices:	(See Note 19)	--	--

	250-C28B	250-C28C	250-C30	250-C30M
ELECTRONIC POWER TURBINE OVERSPEED CONTROL SYSTEM	P/N 23001750, 23001777, 23004822	--	P/N 23001751, 23001768, 23004821	P/N 23004821
	Overspeed Solenoid Valve, Valcor V5000-1250 or V5000-173	--	Valcor V5000-1310 or V5000-171	--
	P/N 6898865, 6898868, 6899144	--	P/N 6898872 or 6899145 (gas producer speed pick, P/N 6898540)	--
FUEL TYPE	MIL-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM-D1655, Jet A or A-1, or Jet B, MIL-T-83133, Grade JP-8; (For other fuel and limitations, See Notes 11 and 12).			
FUEL PUMP	Single element fuel pump, Sundstrand Model 5000950 Series or TRW Model 388100 Series	--	Single element fuel pump, with jet inducer, Sundstrand Model 5004506 or TRW Model 394400 and a 10 micron fuel filter	--

		250-C28B	250-C28C	250-C30	250-C30M
OIL, LUBRICATION (See Note 12)	MIL-L-7808G or MIL-L-23699 and subsequent revisions.				
IGNITION SYSTEM (See Note 22)	Low-tension capacitor discharge exciter. Simmonds Precision P/N 43754 or 49522 or Allied Signal (Bendix) P/N 10-387150-1 or 10-614950-1. Shunted surface gap spark igniter, Champion P/N CH34187 or AC P/N 8990304 or Auburn P/N 0270769				
TEMPERATURE LIMITS	Maximun Permissible Temperatures	See Note 2	--	--	--
PRESSURE LIMITS	Fuel and Oil Pressure Limits	See Note 5	--	--	--
PRINCIPAL DIMENSIONS	Length overall, mm (in)	1 213.66 (47.782)	1 101.12 (43.351)	1 097.23 (43.198)	1.097(43.198)
	Width, mm (in)	654.71 (25.776)	558.70 (21.996)	558.70 (21.996)	0.559(21.996)
	Height, mm (in)	647.19 (25.480)	647.19 (25.480)	647.19 (25.480)	0.653 (25.715)
WEIGHT	Dry, Includes basic engine, fuel pump, ignition, fuel, control systems and supervisory electronic fuel control, if applicable, kg (lb):	107.96 (238)	107.05 (236)	112.94 (249)	114.19 (251.75)
CENTER OF GRAVITY LOCATIONS	C.G. location, aft of side mount pad, centerline, mm (in):	126.75 (4.99)	141.99 (5.59)	144.78 (5.7)	--
	C.G. location, above side mount pad, centerline, mm (in):	84.07 (3.31)	84.33 (3.22)	83.31 (3.28)	--
	C.G. location, left or right side of engine centerline looking forward, mm (in):	0.76 (0.03)	1.02 (0.04)	0.00	2.03 (0.08)
LIMITATIONS		See Note 1	--	--	--
AIR BLEED		See Note 10	--	--	--

LEGEND: -- Same as preceding
 # Does not apply

II - MODELS

250-C30G2; 250-C30G; 250-C30S

TYPE

Free turbine turboshaft, 1 stage centrifugal flow compressor, 2 stage gas producer turbine, 2 stage power turbine, single combustion chamber with pre-chamber

RATINGS
 (See Note 1)

	250-C30G2	250-C30G	250-C30S
Maximum continuous:			
At sea level, kW (shp)	415.36 (557)	484.70 (650)	--
Gas producer, rpm (est.)	49 104	50 340	--
Output shaft, rpm	9 545	9 518	6 016
Measured rated gas temp., °C (°F)	667 (1 251)	742 (1 368)	--
Takeoff:			
5 min. at sea level, kW (shp)	484.7 (650)	484.7 (650)	--
Gas producer, rpm	50 791	50 340	--
Output shaft, rpm	9 545	9 518	6 016
Measured rated gas temp., °C (°F)	733 (1 352)	742 (1 368)	--
Continuous OEI:			
At sea level, kW (shp)	484.7 (650)	#	#
Gas producer, rpm	50 791	#	#
Output shaft, rpm	9 545	#	#
Measured rated gas temp., °C (°F)	733 (1 352)	#	#

RATINGS (Cont.)	250-C30G2	250-C30G	250-C30S
30 minute OEI power			
At sea level, kW (shp)	484.7 (650)	--	--
Gas producer, rpm	50 791	50 340	--
Output shaft, rpm	9 545	9 518	6 016
Measured rated gas temp., °C (°F)	733 (1 352)	742 (1 368)	--
2 ½ minute OEI power			
At sea level, kW (shp)	521.99 (700)	--	--
Gas producer, rpm	51 661	51 550	--
Output shaft, rpm	9 545	9 518	6 016
Measured rated gas temp., °C (°F)	766 (1 411)	773 (1 424)	--
SHAFT RATIO	3.22:1	--	5.09:1
OUTPUT SHAFT	Flanged Drive	Internal spline	--
CONTROL SYSTEM			
Allied Signal (Bendix) gas producer fuel control:	DP-V1	--	--
Allied Signal (Bendix) power turbine governor:	AL-AD1	--	--
Pneumatic accumulators and check valves or orifices:	(See Note 19)	--	--
ELECTRONIC POWER TURBINE OVERSPEED CONTROL SYSTEM	N2 Overspeed Control P/N 23054053	N2 Overspeed Control, P/N 23001751, 23001768, 23004821	--
	Overspeed Solenoid Valve Valcor V5000-1310 or V5000-171	--	--

		250-C30G2	250-C30G	250-C30S
ELECTRONIC POWER TURBINE OVERSPEED CONTROL SYSTEM (Cont.)		P/N 6898872 or 6899145 (gas producer speed pick, P/N 6898540)	--	--
FUEL TYPE	MIL-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM-D1655, Jet A or A-1, or Jet B, MIL-T-83133, Grade JP-8; (For other fuel and limitations, See Notes 11 and 12).			
FUEL PUMP		Single element fuel pump, with jet inducer, Sundstrand Model 5004506 or TRW Model 394400 and a 10 micron fuel filter	--	--
OIL, LUBRICATION (See Note 12)	MIL-L-7808G or MIL-L-23699 and subsequent revisions			
IGNITION SYSTEM (See Note 22)	Low tension capacitor discharge exciter. Simmonds Precision P/N 43754 or 49522 or Allied Signal (Bendix) P/N 10- 387150-1 or 10-614950-1. Shunted surface gap spark igniter, Champion P/N CH34187 or AC P/N 8990304 or Auburn P/N 0270769			
TEMPERATURE LIMITS	Maximum Permissible Temperatures	See Note 2	--	--
PRESSURE LIMITS	Fuel and Oil Pressure Limits	See Note 5	--	--
PRINCIPAL DIMENSIONS	Length overall, mm (in)	1097.2292 (43.1980)	43.1980	--
	Width, mm (in)	558.698 (21.9960)	21.9960	--
	Height, mm (in)	653.161 (25.7150)	25.4800	--

		250-C40B	250-C47B	250-C47M
WEIGHT	Dry, includes basic engine, fuel pump, ignition, fuel, control systems and supervisory electronic fuel control, if applicable , kg (lb):	117.93 (260)	113.85 (251)	112.94 (249)
CENTER OF GRAVITY LOCATIONS	C.G. location, aft of side mount pad, centerline, mm (in)	137.92 (5.43)	149.61 (5.89)	144.78 (5.70)
	C.G. location, above side mount pad, centerline, mm (in)	66.80 (2.63)	84.58 (3.33)	83.31 (3.28)
	C.G. location, left or right side of engine centerline looking forward, mm (in)	3.30 (0.13)	0.00	--
AIR BLEED		See Note 10	--	--

LEGEND: -- Same as preceding;
Does not apply.

III - MODELS

250-C40B; 250-C47B; 250-C47M

TYPE

Free turbine turboshaft, 1 stage centrifugal flow compressor, 2 stage gas producer turbine, 2 stage power turbine, Single combustion chamber with pre-chamber

RATINGS

(See Note 1)

Maximum continuous:

At sea level, kW (shp)	457.1 (613)	447.4 (600)	--
Gas producer, rpm	48 488	48 258	48 348
Output shaft, rpm	9 598	6 317	6 016
Measured rated gas temp., °C (°F)	684 (1 263)	678 (1 253)	--

Takeoff:

5 min. at sea level, kW (shp)	533.2 (715)	484.7 (650)	--
Gas producer, rpm	49 791	48 863	48 965
Output shaft, rpm	9 598	6 317	6 016
Measured rated gas temp., °C (°F)	763 (1 356)	702 (1 296)	--

Continuous OEI:

At sea level, kW (shp)	533.2 (715)	#	#
Gas producer, rpm	49 791	#	#
Output shaft, rpm	9 598	#	#
Measured rated gas temp., °C (°F)	763 (1 356)	#	#

30 minute OEI power :

At sea level, kW (shp)	533.2 (715)	#	#
Gas producer, rpm	49 791	#	#
Output shaft, rpm	9 598	#	#
Measured rated gas temp., °C (°F)	763 (1 356)	#	#

RATINGS (Cont.)	250-C40B	250-C47B	250-C47M
2 minute OEI power :			
At sea level, kW (shp)	574.2 (770)	#	#
Gas producer, rpm	50 553	#	#
Output shaft, rpm	9 598	#	#
Measured rated gas temp., °C (°F)	760 (1 400)	#	#
30 second OEI power :			
At sea level, kW (shp)	611.47 (820)	#	#
Gas producer, rpm	51 323	#	#
Output shaft, rpm	9 598	#	#
Measured rated gas temp., °C (°F)	786 (1 447)	#	#
SHAFT RATIO	3.22:1	5.09:1	--
OUTPUT SHAFT	Flanged Drive	Internal spline	--
CONTROL SYSTEM	Chandler Evans FADEC System		
	Chandler Evans Electronic Control Unit (ECU)		All Models
	Chandler Evans Hydro-Mechanical Unit (HMU)		
ELECTRONIC POWER TURBINE OVERSPEED CONTROL SYSTEM	Integral to FADEC System	- -	- -
FUEL TYPE	MIL-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM-D1655, Jet A or A-1, or Jet B, MIL-T-83133, Grade JP-8; (For other fuel and limitations, See Notes 11 and 12).		
FUEL PUMP	Two-stage suction system, integral to HMU	--	--

		250-C40B	250-C47B	250-C47M
OIL, LUBRICATION (See Note 12)	MIL-L-7808G or MIL-L-23699 and subsequent revisions		All Models	
IGNITION SYSTEM (See Note 22)	Lucas Aerospace, solid-state, high energy exciter unit		All Models	
TEMPERATURE LIMITS	Maximum Permissible Temperatures	See Note 2	--	--
PRESSURE LIMITS	Fuel and Oil Pressure Limits	See Note 5	--	--
PRINCIPAL DIMENSIONS	Length overall, mm (in)	1 097.23 (43.1980)	1 097.23 (43.1980)	--
	Width, mm (in)	558.70 (21.9960)	558.70 (21.9960)	--
	Height, mm (in)	653.16 (25.7150)	638.30 (25.1300)	653.16 (25.7150)
WEIGHT	Dry, includes basic engine, ignition, fuel control system including fuel pump, harness, and ½ of inter - ECU harness, kg (lb):	127.0 (280)	124.3 (274) (no inter-ECU harness)	--
CENTER OF GRAVITY LOCATIONS	C.G. location, aft of side mount pad, centerline, mm (in)	138.2 (5.44)	148.8 (5.86)	--
	C.G. location, above side mount pad, centerline, mm (in)	62.5 (2.46)	74.9 (2.95)	--
	C.G. location, left or right side of engine centerline looking forward, mm (in)	3.56 (0.14) (right)	3.30 (0.13) (right)	--
AIR BLEED		See Note 10	--	--

LEGEND: -- Same as preceding
Does not apply

CERTIFICATION BASIS

The Certification Basis for the engines are those indicated in the RBHA 33 which endorses the FAR 33 effective 01 February 1965, and Amendments 33-2, 33-3, 33-4, and Exemption No. 2087B from FAR 33.69, Regulatory Docket No. 13294 issued February 24, 1975, and amended December 10, 1991, (Docket No. 26072).

Models	Application	Issued TC
250-C28B	24 Oct. 1973	01 June 1979
250-C28C	24 Oct. 1973	01 June 1979
250-C30	24 Oct. 1973	01 June 1979
250-C30G	28 Sept. 1992	14 April 1993
250-C30S	19 Nov. 1992	20 July 1993
250-C30G2	12 May 1993	01 Sept. 1994
250-C40B	14 Aug. 1996	20 Aug. 1997
250-C47B	14 Aug. 1996	20 Aug. 1997
250-C47M	12 June 1997	20 Aug. 1997
250-C30M	09 Aug. 2001	04 Jan. 2002

IMPORT REQUIREMENTS

Each engine imported separately and/or spare parts must be accompanied by an export airworthiness approvals issued by a foreign primary authority approval 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.

PRODUCTION BASIS

Production Certificate No. 310

NOTES

NOTE 1 The engine ratings, unless otherwise specified, are based on static sea level standard conditions under the following A & B conditions:

A.

(1) Compressor inlet air (dry) 15 °C (59 °F), 77.62 kPa (29.92 in Hg).

(2) No external accessory loads and no air bleed extraction.

(3) Compressor inlet bell attached (250-C28, -C28C, -C30, -C40, and -C47 series) to provide suitable air approach conditions.

B. Measured rated gas temperature is indicated by the average of the 4 gas temperature thermocouples.

NOTE 2 Maximum permissible temperatures:

	250-C28B	250-C28C	250-C30, -C30S	250-C30G	250-C30G2
Measured gas temperature, °C(°F)					
2 ½ minute OEI power,	810 (1490)	--	826 (1518)	--	--
30 minute OEI power	791 (1455)	--	798 (1468)	--	--
Continuous OEI	#	#	#	#	768 (1414)
Takeoff	791 (1455)	--	768 (1414)	--	--
Maximum Continuous	791 (1455)	--	768 (1414)	--	716 (1320)
Maximum Transients	810 (1490) to 871 (1600) (not to exceed 6 s)	--	826 (1518) to 906 (1662) (not to exceed 6 s)	826 (1518) to 906 (1662) (not to exceed 12s)	--
	250-C30M	250-C40B	250-C47B	250-C47M	
Starting (not to exceed 10 s)	810 (1490) to 927 (1700)	--	826 (1518)	--	--
Starting (momentary peak of one second maximum)	927 (1700)	--	--	--	--

**NOTE 2
(Cont.)**

	250-C28B	250-C28C	250-C30, -C30S	250-C30G	250-C30G2
Oil inlet temperatures	-54 (65) to 107 (225)	--	--	--	--
30 seconds OEI power	#	871 (1600)	#	#	
2 minute OEI power	#	827 (1521)	#	#	
30 minute OEI power	#	798 (1468)	#	#	
Continuous OEI	#	779 (1435)	#	#	
Takeoff	768 (1414)	779 (1435)	--	--	
Maximum Continuous	716 (1 320)	1 340°F(727°C)	--	--	
Maximum Transients	768 (1 414) to 871 (1 600) (not to exceed 12 s)	798 (1 468) to 905 (1662) (not to exceed 12 s)	779 (1435) to 906 (1662) (not to exceed 12 s)	--	
Starting (not to exceed 10 s)	826 (1 518) to 927 (1 700)	843 (1 550) to 927 (1 700)	--	--	
Starting (momentary peak of one second maximum)	927 (1700)	927 (1700)	--	--	
Oil inlet temperatures	- 54 (65) to 107 (225)	--	--	--	

LEGEND -- Same as preceding
Does not apply

NOTE 3 Shaft speed limits

For the Model 250-C28 Series, the maximum output shaft speed for momentary transients (up to 15 seconds) varies linearly from 115 percent at flight autorotation to 105 percent at takeoff. The maximum output shaft speed limit for sustained periods varies linearly from 113 percent at flight autorotation to 103 percent at takeoff. Gas producer speeds are permissible up to 105 percent for 10 seconds and up to 104 percent for sustained periods. 100 percent output shaft speed is defined as 6016 rpm and 100 percent gas producer speed is defined as 50 940 rpm.

For the Models 250-C30, -C30M, -C30S, -C30G, and -C30G/2, the maximum output shaft speed for momentary transients (up to 15 seconds) varies linearly from 119 percent at flight autorotation to 109 percent at 2 ½ minute OEI power. The maximum output shaft speed limit for sustained periods varies linearly from 114 percent at flight autorotation to 107.1 percent at 2 ½ minute OEI power. The minimum output shaft speed for sustained periods varies linearly from 90 percent at flight autorotation to 88 percent at 2 ½ minute OEI power.

For the Model 250-C40B, the maximum output shaft speed for momentary transients (up to 15 seconds) varies linearly from 118 percent (11 326 rpm) at flight autorotation to 107 percent (10 270 rpm) at 30 second OEI power. The maximum output shaft speed limit for sustained periods varies linearly from 113 percent (10 846 rpm) at flight autorotation to 105 percent (10 078 rpm) at 30 second OEI power. The minimum output shaft speed for continuous operation is 90 percent (8 638 rpm).

For the Model 250-C47B, the maximum output shaft speed for momentary transients (up to 15 seconds) varies linearly from 113.3 percent (7 031 rpm) at flight autorotation to 103.8 percent (6 557 rpm) at takeoff power. The maximum output shaft speed limit for sustained periods varies linearly from 108.6 percent (6 860 rpm) at flight autorotation to 102.1 percent (6 450 rpm) at takeoff power. The minimum output shaft speed for continuous operation is 86% (5 414 rpm).

Gas producer speeds are permissible up to 106 percent for 10 seconds and up to 105 percent for sustained periods. 100 percent output shaft speed is defined as 6016 rpm (9 518 rpm for -C30G only; 9 545 rpm for -C30G/2 only; 9 598 rpm for -C40B only; and 6 317 rpm for -C47B only) and 100 percent gas producer speed is defined as 51000 rpm.

NOTE 4 Shaft Torque Limits

The maximum allowable torque as measured by the torquemeter for below standard inlet air temperature and/or ram conditions for the Model 250-C28 is 627.7 N.m (463 lb.ft) for takeoff and 30 minute OEI power, 565.4 N.m (417 lb.ft) for maximum continuous and 650.8 N.m (480 lb.ft) for 10 seconds. The maximum allowable torque for the Models 250-C28B and -C28C is 627.7 N.m (463 lb.ft) for takeoff, 30 minute OEI power, and maximum continuous, 663 N.m (489 lb.ft) for 2 ½ minute OEI power and 676.6 N.m (499 lb.ft) for 10 seconds on the 250-C28B and 829.8 N.m (612 lb.ft) for 10 seconds on the 250-C28C.

The maximum allowable torque for the Models 250-C30 and -C30S is 799.9 N.m (590 lb.ft) for takeoff, 30 minute OEI power and maximum continuous, 850.1 N.m (627 lb.ft) for 2 ½ minute OEI power and 1189 N.m (877 lb.ft) for 16 seconds.

The maximum allowable torque for the Models 250 -C47B and -C47M is 799.9 N.m (590 lb.ft) for takeoff , 710.4 N.m (524 lb.ft) for maximum continuous, and 863.7 N.m (637 lb.ft) for 10 seconds and 930.1 N.m (686 lb.ft) for 2 seconds.

The maximum allowable torque for the Model 250-C30G is 505.7 N.m (373 lb.ft) for takeoff, 30 minute OEI power and maximum continuous, 539.6 N.m (398 lb.ft) for 2 ½ minute OEI power and 706.4 N.m (521 lb.ft) for 16 seconds.

The maximum allowable torque for the Model 250-C30G/2 is 504.4 N.m (372 lb.ft) for takeoff and continuous OEI power, 416.2 N.m (307 lb.ft) for maximum continuous power, 532.8 N.m (393 lb.ft) for 30 minute OEI power, 547.8 N.m (404 lb.ft) for 2 ½ minute OEI power and 706.4 N.m (521 lb.ft) for 16 seconds.

The maximum allowable torque for the Model 250-C40 is 554.2 N.m (409 lb.ft) for takeoff and continuous OEI power, 458.3 N.m (338 lb.ft) for maximum continuous power, 585.7 N.m (432 lb.ft) for 30 minute OEI power, 602.0 N.m (444 lb.ft) for 2 minute OEI power and 626.4 N.m (462 lb.ft) for 30 second OEI power and 706.4 N.m (521 lb.ft) for 16 seconds.

NOTE 5 Fuel and oil pressure limits are as follows:

(a) Fuel pressure limits for the 250-C28 series:

Applicable to MIL-T-5624 and ASTM-D1655 Jet A or A-1, or MIL-T-83833JP-8, minimum at fuel connection to engine: not less than ambient pressure minus 30.38 kPa (- 9 in.Hg) at sea level; ambient minus 18.62 kPa (-5.5 in.Hg) at 1 829 m (6 000 ft); ambient minus 11.85 kPa (-3.5 in.Hg) at 3084 m (10 000 ft); ambient minus 3.39 kPa (-1.0 in.Hg) at 4 572 m (15 000 ft); and ambient plus 5.08 (+1.5 in.Hg) at 6 096 (20 000 ft) altitude. Maximum pressure 84.66 kPa (25 psig). No inlet depression permitted with MIL-G-5572 fuel.

(b) Fuel pressure limits for the 250-C30, -C30M, -C30S, C30G, C30G/2:

Pressure shall range from a minimum at the fuel inlet connection no lower than atmospheric (or tank pressure, whichever is higher) minus 27.58 kPa (4.0 psi) using ASTM D 1655, Type A, A1, or equivalent, at -28.8°C to 54.4°C (-20°F to 130°F), or minus a pressure which varies linearly from 27.58 kPa (4.0 psi) at sea level to 15.44 kPa (2.24 psi) at 4 572 m (15 000 ft), and a constant 15.44 kPa (2.24 psi) to 6 096 m (20 000 ft) using Type B at -28.8°C to 43.3°C (-20°F to 110°F); to a maximum of 172.37 kPa (25 psig) with a vapor-to-liquid ratio (V/L) not greater than 0.30. The minimum pressure for satisfactory fuel pump ejector performance is 6.89 kPa (1 psi) at 4 572 m (15 000 ft) and 20.68 kPa (3.0 psi) at 6 096 m (20 000 ft) measured at the after-filter port.

(c) Fuel pressure limits for the 250-C40B, 250-C47B, 250-C47M:

Minimum allowable-fuel pressure varies as a function of fuel type, fuel temperatures and altitude tables, curves and methods for determining the minimum fuel pressure is included in the Installation Design Manual: 250-C40B IDM Publication No. CSP24001, 250-C47B IDM Publication No. CSP24002. 250-C47M IDM Publication No. CSP24003. Maximum allowable fuel pressure is 84.66 kPa (25 psig).

NOTE 5 (Cont.) (d) Operating oil gage pressures for the 250-C28, 250-C30, 250-C40, and 250-C47 series:

<u>-C28 Series</u>	<u>-C30, -C40, and -C47 Series</u>	<u>Oil Gage Pressure Limit</u>
47 884 rpm (94%) gas generator speed and above	47 940 rpm (94%) gas generator speed and above	792.88 to 896.32 kPa (115 to 130 psig)
40 234 rpm (79.0%) to 47 884 rpm	40 290 rpm (79.0%) to 47 940 rpm	620.53 to 896.32 kPa (90 to 130 psig)
Below 40 243 rpm Oil pump inlet pressure:	Below 40 290 rpm Oil pump inlet pressure	344.74 to 896.32 kPa (50 to 130 psig) 16.93 kPa (5 in.Hg) absolute minimum

NOTE 6 The following accessory drive mounting provisions are available:

250-C28 Series	Direction of Rotation *	Speed Ratio to Turbine	Max. Torque N.m (in.lb)		Max. Overhang Moment N.m (in.lb)
			Continuous	Static	
Driven by Gas Producer Turbine					
Tachometer	CC	0.0825	0.8 (7)	5.6 (50)	0.45 (4)
Starter-Generator	C	0.2351	62.14 (550) **	124.28 (1 100)	16.95 (150)
Driven by Power Turbine					
Tachometer	CC	0.1257	0.8 (7)	5.6 (50)	0.45 (4)
Power Take-off	C	0.180	662.99 (5 868) ***	1 130 (10 000)	11.30 (100)
Spare	C	0.3600	8.93 (79)	44.63 (395)	16.95 (150)

NOTE 6 * C - Clockwise viewing drive pad CC-Counterclockwise
 (Cont.) ** The maximum generator load is 12 horsepower.
 *** The sum of the torques extracted in any combination from the front and rear power output drives shall not exceed the torque values specified in Note 4.
 The value given in the above table represents the 2 ½ minute limited maximum total torque.

250-C30, 250-C40 and 250-C47 Series:	Direction of Rotation *	Speed Ratio to Turbine	Max. Torque N.m (in.lb)		Max. Overhang Moment N.m (in.lb)
			Continuous	Static	
Driven by Gas Producer Turbine					
Tachometer	CC	0.0825	0.8 (7)	5.6 (50)	0.45 (4)
Starter-Generator	C	0.2351	62.14 (550) **	124.28 (1 100)	16.95 (150)
Spare	CC	0.2351	62.14 (550) ****	124.28 (1 100)	16.95 (150)
Driven by Power Turbine					
Tachometer	CC	0.1370	0.8 (7)	5.6 (50)	0.45 (4)
Tachometer (250-C30G, -30G/2 and -C40B only)	CC	0.2168	0.45 (4)	3.62 (32)	0.45 (4)
Power Take-off	C	0.1963	850.1 (7 524) ***	1 130 (10 000)	11.30 (100)
Power Take-off (250-C30G only)	C	0.3105	538.4 (4 765) ***	714.2 (6 321)	11.30 (100)
Power Take-off (250-C30G/2 only)	CC	0.3105	547.5 (4 846) ***	727.96 (6 443)	42.9 (380)
Power Take-off (250-C40B only)					
30 second OEI limit maximum (Front Drive)	CC	0.3105	626.4 (5 544) *****	727.96 (6 443)	42.9 (380)
30 minute OEI limit maximum (Front Drive)	CC	0.3105	585.7 (5 184) *****	(6 443)	42.9 (380)
Rear Drive	CC	0.3105	8.1 (72)	9.5 (84)	0.45 (4)

- NOTE 6 (Cont.)**
- * C - Clockwise viewing drive pad; CC – Counterclockwise
 - ** The maximum generator load is 12 horsepower.
 - *** The sum of the torques extracted in any combination from the front and rear power output drives shall not exceed the torque values specified in Note 4. The value given in the above table represents the 2 ½ minute OEI limited maximum total torque applicable to Models 250-C30, -C30S, -C30G, and -C30G/2.
 - **** The maximum accessory load is 6 horsepower.
 - ***** The sum of the torques extracted in any combination from the front and rear output drives shall not exceed the torque values specified in Note 4.

- NOTE 7**
- 250-C28 Basic Mode
 - 250-C30P Similar to -C30 but with no 2 ½ or 30 min. OEI ratings.
 - 250-C28B Similar to -C28 except compressor and turbine changes which result in an increased power rating and the addition of an inlet particle separator.
 - 250-C28C Identical to -C28B except without particle separator.
 - 250-C30 Similar to -C28C except compressor and turbine changes which result in an increased power rating.
 - 250-C30S Similar to -C30 except compressor production changes which result in 5 percent new or overhaul performance margin.
 - 250-C30G Similar to -C30S but with 9 518 rpm power takeoff shaft speed.
 - 250-C30G/2 Similar to -C30G but with 9 545 rpm power takeoff shaft speed at 100% power turbine speed of 30 737 rpm, continuous OEI rating added, and flanged power takeoff drive system utilized in place of spline drive system.
 - 250-C30M Similar to -C30 but with no 2 ½ or 30 min. OEI ratings and adapted for torque tube mounting.
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NOTE 7 (Cont.) 250-C40B Similar to -C30G/2 but with 9 598 rpm output shaft speed at 100% power turbine speed of 30 908 rpm, no 2 ½min. OEI rating, but 30 sec. OEI and 2 min. OEI ratings added, and single channel FADEC (Full Authority Digital Electronic Control) system with manual backup, and -C30R/1 flow path changes.

250-C47B Similar to -C30P but with 6 317 rpm output shaft speed at 100% power turbine speed of 32 183 rpm and -C30R/1 flow path changes. Has single channel FADEC system with manual backup similar to the 250-C40B.

250-C47M Similar to C47B but with 6 016 rpm output shaft speed at 100% power turbine speed of 30 650 rpm.

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 8 Reserved.

NOTE 9 Reserved.

NOTE 10 External air bleed may not exceed 4.5 percent for the Models 250-C28, 250-C30, 250-C40, and 250-C47 series and 4.0 percent for the Models 250-C28B and 250-C28C.

NOTE 11 For the Model 250-C28 series emergency use of aviation gasoline MIL-G-5572, all grades, is limited to the amount of fuel required to operate the engine for not over 6 hours during any overhaul period. Emergency use of aviation gasoline is permitted in Models 250-C30, -C30M, -C30S and -C30G/2 for a maximum of 6 hours during any overhaul period provided aircraft boost pumps are available and turned on. Emergency use of aviation gasoline is permitted in Model 250-C40B, and 250-C47B and C47M for a maximum of 6 hours during any overhaul period. For all models a mixture consisting of 1/3 by volume of aviation gasoline MIL-G-5572, grade 80/87 and 2/3 by volume MIL-T-5624, grade JP-5, or aviation turbine fuels ASTM-D1655, Jet A or A-1, may be used for unrestricted periods of time. A mixture consisting of 1/3 by 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, 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 type fuels. The 250-C28, 250-C30, 250-C40 and 250-C47 serie engines are approved for use with C.I.S. Specification fuels and Romanian fuel in accordance with Commercial Service Letter 2102/3105/5050/6050. The 250-C28, 250-C30, 250-C40 and 250-C47 series engines are approved for use with fuel Chinese specification GB6537-94 RP-3.

NOTE 12 Fuels containing Tri-Cresyl-Phosphate additives shall not be used. Shell anti-static additive is approved for use at a concentration that will not exceed fuel conductivity of 300 pico-ohms per meter. Anti-icing additives conforming to MIL-I-27686 are approved for use in fuels in amounts not to exceed 0.15 percent by volume.

NOTE 13 Reserved.

NOTE 14 Reserved.

NOTE 15 Reserved.

NOTE 16 The maximum allowable torque as measured by the torquemeter for below standard inlet air temperature and/or ram conditions for the Model 250-C28 is 627.7 N.m (463 lb.ft) for takeoff and 30 minute OEI power, 565.4 N.m (417 lb.ft) for maximum continuous and 650.8 N.m (480 lb.ft) for 10 seconds. The maximum allowable torque for the Models 250-C28B and -C28C is 627.7 N.m (463 lb.ft) for takeoff, 30 minute OEI power, and maximum continuous, 663 N.m (489 lb.ft) for 2 ½ minute OEI power and 676.6 N.m (499 lb.ft) for 10 seconds on the 250-C28B and 829.8 N.m (612 lb.ft) for 10 seconds on the 250-C28C.

The maximum allowable torque for the Models 250-C30 and -C30S is 799.9 N.m (590 lb.ft) for takeoff, 30 minute OEI power and maximum continuous, 850.1 N.m (627 lb.ft) for 2 ½ minute OEI power and 1189 N.m (877 lb.ft) for 16 seconds.

The maximum allowable torque for the Models 250 -C47B and -C47M is 799.9 N.m (590 lb.ft) for takeoff , 710.4 N.m (524 lb.ft) for maximum continuous, and 863.7 N.m (637 lb.ft) for 10 seconds and 930.1 N.m (686 lb.ft) for 2 seconds.

The maximum allowable torque for the Model 250-C30G is 505.7 N.m (373 lb.ft) for takeoff, 30 minute OEI power and maximum continuous, 539.6 N.m (398 lb.ft) for 2 ½ minute OEI power and 706.4 N.m (521 lb.ft) for 16 seconds.

The maximum allowable torque for the Model 250-C30G/2 is 504.4 N.m (372 lb.ft) for takeoff and continuous OEI power, 416.2 N.m (307 lb.ft) for maximum continuous power, 532.8 N.m (393 lb.ft) for 30 minute OEI power, 547.8 N.m (404 lb.ft) for 2 ½ minute OEI power and 706.4 N.m (521 lb.ft) for 16 seconds.

The maximum allowable torque for the Model 250-C40 is 554.2 N.m (409 lb.ft) for takeoff and continuous OEI power, 458.3 N.m (338 lb.ft) for maximum continuous power, 585.7 N.m (432 lb.ft) for 30 minute OEI power, 602.0 N.m (444 lb.ft) for 2 minute OEI power and 626.4 N.m (462 lb.ft) for 30 second OEI power and 706.4 N.m (521 lb.ft) for 16 seconds.

NOTE 17 The ejector tube assembly for the Model 250-C28B is airframe mounted.

NOTE 18 Reserved.

NOTE 19 A pneumatic accumulator(s), double check valve(s) or other attenuating devices can be incorporated for compatibility with the rotor system of the particular model rotorcraft in which the engine is to be installed, except for electronically controlled Models 250-C40B, C47B and -C47M.

NOTE 20 A magnetic oil drain plug (chip detector) indicator lamp is an installation requirement.

NOTE 21 All Model 250-C30 series engines incorporate an overspeed #1 wheel internal energy absorbing ring, either by initial production or by retrofit.

NOTE 22 Model 250-C30, -C30S, and -C30G engines are equipped with dual ignition. The remaining models have a single ignition system. A dual ignition kit is available for the Model 250-C28B and -C28C engines. Exemption No. 2087B (from FAR 33.69), 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 23 Life limits established for critical rotating components are published in the corresponding Allison Gas Turbine 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.

NOTE 24 Engines produced under this type certificate are approved for operation with unprotected inlets having been tested in accordance with Group I and Group II Foreign Objects Ingestion criteria of FAA Advisory Circular AC 33-1B.

NOTE 25 Model 250-C30, -C30S, -C30G, -C30G/2, -C40B, -C47B and -C47M and engines comply with the following sections of FAR 33-6: 33.17(b), 33.67(a), (b) 33.68(a), (b), and 33.71 (a), (b) except that oil strainers are not incorporated ahead of each scavenge pump. In addition, Model 250-C30G/2 and -C40B engines comply with the following sections of FAR 33-12 related to the Continuous OEI rating: 33.7 and 33.87. Model 250-C40B, -C47B and -C47M engines comply with section 33.28 of FAR 33-15 as related to the Full Authority Digital Electronic Control (FADEC) system. Engine Models 250-C40B, -C47B and -C47M have demonstrated compliance with the applicable sections of 33.27, 33.75, 33.87, 33.89 and 33.91 of FAR 33-15.

- NOTE 26** Fuel controls for these engines provide for maximum flow stop settings as follows: For the 250-C28B and -C28C, 360 PPH; for the -C30 series, 440 PPH; for the -C40 and C47 series, 500 PPH. In addition, for use in the field, settings of 293 PPH for the -C28B and -C28C, 353 PPH, 313 PPH and 284 PPH are available for 250-C30 Series engines.
- NOTE 27** Applicable to the Model 250-C40B, and C47M, engines. Operational use of the on-line software loader in the field is prohibited.
- Applicable to the Model -C47B engine, operational use of the on-line loader in the field is approved for Software Version 5.201, or later FAA approved Software Version, per applicable FAA Approved Commercial Engine Bulletin.
- NOTE 28** A press-to-test indicator lamp for N2 overspeed control system is an installation requirement.
- NOTE 29** Compliance with Allison Commercial Engine Alert Bulletin CEB-A-73-3018 and any subsequent FAA-approved revisions are an installation requirement for the Model 250-C30M engine.

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