TYPE-CERTIFICATE DATA SHEET

EASA.IM.E.052

for
250 Series II engines

Type Certificate Holder
Rolls-Royce Corporation
South Meridian Street
Indianapolis
Indiana 46225-1103
United States of America

For Models:

250-C18
250-C18A
250-C18C
250-C20
250-C20B
250-C20F
250-C20J
250-C20R
250-C20R/1
250-C20R/2
250-C20R/4
250-C20S
250-C20W
250-C300/A1

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I. General

1. Type/ Model

Model 250 Series II engines / 250-C18, -C18A, -C18C, -C20, -C20B, -C20F, -C20J, -C20R, -C20R/1, -C20R/2, -C20R/4, -C20S, -C20W, -C300/A1

With the exception of the Model 250-C20S, these engines are approved for use in single- or twin-engine civil rotorcraft at the ratings and within the operating limitations specified below, subject to compliance with the powerplant installation requirements appropriate to approved installations. The Model 250-C20S is approved for use in civil turboprop aeroplanes subject to the same requirements.

2. Type Certificate Holder

Rolls-Royce Corporation
South Meridian Street
Indianapolis
Indiana 46225-1103
United States of America

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

3. Manufacturer

Rolls-Royce Corporation

4. Date of Application

11 August 2008 for 250-C300/A1

5. Certification Reference Date

10 January 1959 for the 250-C18, -C18A, -C18C, -C20, -C20B, -C20F, -C20J, -C20R, -C20R/1, -C20R/2, -C20R/4, -C20S and –C20W

04 May 1990 for the –C300/A1

6. EASA Type Certification Date

EASA Type Certification of all Model 250 Series II engine models except the 250-C300/A1, is granted, in accordance with Article 2a paragraph 1(a)(i) of EU Commission Regulation (EC) 1702/2003, as amended by Commission Regulation (EC) 375/2007, on the basis of EU Member State Validations prior to 28 September 2003, listed in the following table.

	U.K. CAA	**France DGAC**	**Germany LBA**
250-C18	–	–	02 Apr 1969
250-C18A	–	–	02 Apr 1969
250-C18C	07 Sep 1970	–	–
250-C20	–	–	15 Apr 1971
250-C20B	–	02 Feb 1979	01 Aug 1979
250-C20F	20 Aug 1979	21 Oct 1980	28 Aug 1981
250-C20J	30 Mar 1982	26 Feb 1986	16 Sep 1982
250-C20R	31 Aug 1994	23 Jan 1991	24 Feb 1995
250-C20R/1	08 Dec 1988	23 Jan 1991	27 Jul 1989
250-C20R/2	08 Dec 1988	23 Jan 1991	15 May 1991
250-C20R/4	26 Mar 1998	12 Jan 1996	15 May 1991
250-C20S	–	–	27 Jul 1989
250-C20W	–	19 Jul 1995	07 Feb 1995

22 June 2011 for the 250-C300/A1

II. Certification Basis

1. EASA Certification Basis

1.1. Airworthiness Standards

For the 250-C18, -C18A, -C18C, -C20, -C20B, -C20F, -C20J, -C20R, -C20R/1, -C20R/2, -C20R/4, -C20S and –C20W,
Part 13 of the Civil Air Regulations (USA), up to and including Amendment 3, effective 10 January 1959, plus Exemption No. 219B (USA) from CAR 13.211.

For the 250-C300/A1, JAR-E Change 8, effective 04 May 1990.

1.2. Special Conditions (SC)

None.

1.3. Equivalent Safety Findings (ESF)

None.

1.4. Deviations

None.

1.5. Environmental Protection

Fuel Venting per ICAO Annex 16, Volume II, Amendment 6, dated 20 November 2008, Part 2, Chapter 2.

III. Technical Characteristics

1. Type Design Definition

The Type Design Definition is in accordance with the following Rolls-Royce Corporation Engine Parts Lists:

250-C18	4203
250-C18A	4203
250-C18C	4203
250-C20	4241
250-C20B	4242
250-C20F	4269
250-C20J	4274
250-C20R	4290
250-C20R/1	4295
250-C20R/2	4296
250-C20R/4	4305
250-C20S	4283
250-C20W	4304
250-C300/A1	10010

and later approved Engine Parts Lists published in the applicable Operation and Maintenance Manual.

2. Description

The Model 250 Series II engines have a front axial air inlet, a compressor driven by a two-stage axial gas generator turbine, and a two-stage axial free power turbine. The compressors of all Model 250 Series II engines except the 250-C300/A1 have either four or six axial stages plus a single centrifugal stage. The 250-C300/A1 compressor consists of a single centrifugal stage only.

3. Equipment

All equipment required for engine operation is included in the Type Design Definition. For additional details, refer to the applicable Installation Manual.

4. Dimensions

	Overall Length mm	Overall Width mm	Overall Height mm
250-C18	1026	483	572
250-C18A	1026	483	572
250-C18C	1026	483	572
250-C20	1037	483	589
250-C20B	1037	483	589
250-C20F	1037	483	589
250-C20J	1037	483	589
250-C20R	1038	527	589
250-C20R/1	1038	527	589
250-C20R/2	1038	527	589
250-C20R/4	1038	527	589
250-C20S	1035	477	574
250-C20W	1035	477	574
250-C300/A1	954	545	603

5. Dry Weight

	Weight kg	
	Baseline Configuration	With optional first stage turbine wheel energy absorbing ring (available for retrofit)
250-C18(1)	64.0	–
250-C18A(1)	64.0	–
250-C18C(1)	64.0	–
250-C20(1)	71.7	–
250-C20B(1)	71.7	73.0
250-C20F(1)	71.7	73.0
250-C20J(1)	71.7	73.0
250-C20R(1)	78.5	–
250-C20R/1(1)	78.5	–
250-C20R/2(1)	76.7	–
250-C20R/4(1)	76.7	–
250-C20S(1)	72.1	73.5
250-C20W(1)(2)	73.5	–
250-C300/A1(3)	91.2	–

(1) Includes essential engine accessories but excludes the starter-generator.
(2) Includes first stage turbine wheel energy absorbing ring
(3) Includes essential engine accessories, first stage turbine wheel energy absorbing ring, starter-generator, generator control unit and engine monitoring unit

6. Ratings

6.1 All Engine Operative:

	Power[1] kW		
	Take-Off (5 minutes) Sea Level	Take-Off (5 minutes) Augmented Sea Level[2]	Maximum Continuous Sea Level
250-C18	236	–	201
250-C18A	236	–	201
250-C18C	236	231	201
250-C20	298	–	287
250-C20B	313	313	313
250-C20F	313	313	313
250-C20J	313	313	313
250-C20R	336	–	336
250-C20R/1	336	–	336
250-C20R/2	336	–	336
250-C20R/4	336	–	336
250-C20S	313	313	313
250-C20W	313	–	313
20-C300/A1	224	–	179

6.2 One Engine Inoperative (OEI):

30-Minute OEI Sea Level

	Power[1] kW
250-C18	236
250-C18A	236
250-C18C	236
250-C20	298
250-C20B	313
250-C20F	313
250-C20J	313
250-C20R	336
250-C20R/1	336
250-C20R/2	336
250-C20R/4	336
250-C20S	–
250-C20W	313
250-C300/A1	–

(1) Except as noted in (2) below, the engine ratings are based on dry sea level ICAO standard atmospheric conditions, with no external accessory loads and no air bleed. The quoted ratings are obtainable on a test stand with the fuel, oil, the reference intake and exhaust ducts as specified in the applicable Installation Manual.

(2) The augmented take-off rating is based on an ambient temperature of 35ºC. The water-alcohol solution, nozzle location and system installation must be in accordance with the applicable Installation Manual requirements. Operation with water-alcohol injection is limited to ambient temperatures above 5ºC.

7. Control System

The control system is hydromechanical.

8. Fluids (Fuel, Oil, Coolant, Additives)

See the applicable Operation and Maintenance Manual for specific approved oil, fuel and additives.

9. Aircraft Accessory Drives

9.1 Starter-Generator Pad – Driven by Gas Generator Turbine:

	Rotation(1)	Speed Ratio To Gas Generator Turbine	Maximum Continuous Torque Nm	Maximum Overhung Moment Nm
All Models	C	0.2361	Not specified(2)	10.6

9.2 Spare Pad – Driven by Gas Generator Turbine:

	Rotation(1)	Speed Ratio To Gas Generator Turbine	Maximum Continuous Torque Nm	Maximum Overhung Moment Nm
250-C18	C	0.0728	1.92	2.82
250-C18A	C	0.0728	1.92	2.82
250-C18C	C	0.0728	1.92	2.82
250-C20	C	0.0728	3.95	2.82
250-C20B(3)	C	0.0728	3.95	3.39
250-C20F(3)	C	0.0728	3.95	3.39
250-C20J(3)	C	0.0728	3.95	3.39
250-C20R	–	–	–	–
250-C20R/1	–	–	–	–
250-C20R/2	–	–	–	–
250-C20R/4	–	–	–	–
250-C20S	C	0.0728	3.95	3.39
250-C20W	–	–	–	–
250-C300/A1	–	–	–	–

9.3 Tachometer Pad – Driven by Gas Generator Turbine:

	Rotation(1)	Speed Ratio To Gas Generator Turbine	Maximum Continuous Torque Nm	Maximum Overhung Moment Nm
All Models Except 250-C300/A1	CC	0.0824	0.791	0.452
250-C300/A1	–	–	–	–

9.4 Tachometer Pad – Driven by Power Turbine:

	Rotation(1)	Speed Ratio To Power Turbine	Maximum Continuous Torque Nm	Maximum Overhung Moment Nm
250-C18	CC	0.1197	0.791	0.452
250-C18A	CC	0.1197	0.791	0.452
250-C18C	CC	0.1197	0.791	0.452
250-C20	CC	0.1262	0.791	0.452
250-C20B	CC	0.1262	0.791	0.452
250-C20F	CC	0.1262	0.791	0.452
250-C20J	CC	0.1262	0.791	0.452
250-C20R	CC	0.1262	0.791	0.452
250-C20R/1	CC	0.1262	0.791	0.452
250-C20R/2	CC	0.1262	0.791	0.452
250-C20R/4	CC	0.1262	0.791	0.452
250-C20S	CC	0.1262	0.791	0.452
250-C20W	CC	0.1262	0.791	0.452
250-C300/A1	–	–	–	–

9.5 Rear Power Takeoff – Driven by Power Turbine:

	Rotation(1)	Speed Ratio To Power Turbine	Maximum Torque (30 minutes)(4) Nm	Maximum Overhung Moment Nm
250-C18	C	0.1807	397	11.3
250-C18A	C	0.1807	397	11.3
250-C18C	C	0.1807	397	11.3
250-C20	C	0.1807	499	11.3
250-C20B	C	0.1807	521	11.3
250-C20F	C	0.1807	521	11.3
250-C20J	C	0.1807	521	11.3
250-C20R	C	0.1807	542	11.3
250-C20R/1	C	0.1807	542	11.3
250-C20R/2	C	0.1807	542	11.3
250-C20R/4	C	0.1807	542	11.3

	Rotation(1)	Speed Ratio To Power Turbine	Maximum Torque (30 minutes)(4) Nm	Maximum Overhung Moment Nm
250-C20S	C	0.1807	521(5)	11.3
250-C20W	C	0.1807	521	11.3
250-C300/A1	C	0.1807	521	11.3

(1) C=clockwise; CC=counter-clockwise.
(2) The maximum generator load is 150 amperes (6.9 kW).
(3) Spare pad optional.
(4) The sum of the torque extracted in any combination from the front and rear output drives must not exceed the torque values specified in IV.3.
(5) Maximum continuous torque, not limited to 30 minutes (C250-20S only).

10. Maximum Permissible Air Bleed Extraction

External air bleed may not exceed 4.5% of the total compressor flow. The 250-C300/A1 includes a restrictor that limits external air bleed to 4.5%.

IV. Operating Limitations

1. Temperature Limits

1.1 Climatic Operating Envelope

Refer to the relevant section of the Operation and Maintenance Manual.

1.2 Maximum Measured Gas Turbine Temperature

	Temperature ºC					
	30-Minute OEI	Take-off (5 minutes)	Maximum Continuous	Starting(1)	Transient(2)	Transient(3)
250-C18	749	749	693	927	843	–
250-C18A	749	749	693	927	843	–
250-C18C	749	749	693	927	843	–
250-C20	793	793	777	927	843	–
250-C20B	810	810	810	927	843	899
250-C20F	810	810	810	927	843	899
250-C20J	810	810	810	927	843	899
250-C20R	810	810	810	927	899	899
250-C20R/1	810	810	810	927	899	899
250-C20R/2	810	810	810	927	899	899
250-C20R/4	810	810	810	927	899	899
250-C20S	–	810	810	927	843	–
250-C20W	810	810	810	927	843	899
250-C300/A1	–	782	706	927	843	–

(1) Limited to 1 second duration. Transients of up to 10 seconds duration are permitted at lower temperatures. Consult the applicable Operation and Maintenance Manual for details.
(2) Limited to 6 seconds duration.
(3) Limited to 12 seconds duration and to three occurrences in the life of any turbine wheel.

1.4 Minimum and Maximum Oil Inlet Temperature

	Temperature ºC			
	MIL-L-7808F		MIL-L-23699 or AS 5780 HPC	
	Minimum	Maximum	Minimum	Maximum
All Models Except 250-C300/A1	-54	107	-40	107
250-C300/A1	–	–	-40	107

2. Pressure Limits

2.1 Fuel Pump Inlet Pressure

	Minimum kPa gauge						Maximum kPa gauge
	Sea Level	1829 m	3048 m	4572 m	6096 m	7620 m	
All Models except 250-C20R/2	-23.7(1)	-18.6(1)	-11.2(1)	-2.7(1)	5.1	10.2	172
250-C20R/2	See Installation Manual						

(1) No fuel inlet depression permitted with MIL-G-5572 fuel

2.2 Oil Pump Inlet Pressure

	Operating Range kPa gauge						Minimum kPa absolute
	Above 49586 rpm (97.0%) gas producer turbine speed	39874 rpm (78.0%) gas producer turbine speed to 49586 rpm (97.0%)	Below 39874 rpm (78.0%) gas producer turbine speed	Above 48014 rpm (94.2%) gas producer turbine speed	40011 rpm (78.5%) gas producer turbine speed to 48014 rpm (94.2%)	Below 40011 rpm (78.5%) gas producer turbine speed	
250-C18	758 – 896	621- 896	345 – 896	–	–	–	–
250-C18A	758 – 896	621- 896	345 – 896	–	–	–	–
250-C18C	758 – 896	621- 896	345 – 896	–	–	–	–
250-C20	–	–	–	793 – 896	621- 896	345 – 896	16.9
250-C20B	–	–	–	793 – 896	621- 896	345 – 896	16.9
250-C20F	–	–	–	793 – 896	621- 896	345 – 896	16.9
250-C20J	–	–	–	793 – 896	621- 896	345 – 896	16.9
250-C20R(1)	–	–	–	827 – 896	621- 896	345 – 896	16.9
250-C20R/1(1)	–	–	–	827 – 896	621- 896	345 – 896	16.9
250-C20R/2(1)	–	–	–	827 – 896	621- 896	345 – 896	16.9
250-C20R/4(1)	–	–	–	827 – 896	621- 896	345 – 896	16.9
250-C20S	–	–	–	793 – 896	621- 896	345 – 896	16.9
250-C20W	–	–	–	793 – 896	621- 896	345 – 896	16.9
250-C300/A1	–	–	–	793 – 896	621- 896	345 – 896	16.9

(1) 10% aeration by volume is permitted in oil from a primed pump. Therefore the lower operating limit may decline at the rate of 13.8 kPa per 305 m at altitudes above 1524 m to a maximum reduction of 138 kPa.

3. Maximum / Minimum Permissible Rotor Speeds

	Output Shaft Speed		Gas Producer Speed	
	Transient 15 seconds	Continuous	Transient 15 seconds	Continuous
250-C18(1)	110%	108%	105%	104%
250-C18A(1)	110%	108%	105%	104%
250-C18C(1)	110%	108%	105%	104%
250-C20(2)	113%	108%	106%	105%
250-C20B(2)	113%	108%	106%	105%
250-C20F(2)	113%	108%	106%	105%
250-C20J(2)	113%	108%	106%	105%
250-C20R(2)	113%	108%	106%	105%
250-C20R/1(2)	113%	108%	106%	105%
250-C20R/2(2)	113%	108%	106%	105%
250-C20R/4(2)	113%	108%	106%	105%
250-C20S(2)	110%	105%	106%	105%
250-C20W(2)	113%	108%	106%	105%
250-C300/A1(2)	110%(3)	105%	106%(3)	105%

(1) 100% output shaft speed = 6000 rpm
100% gas producer speed = 51120 rpm
(2) 100% output shaft speed = 6016 rpm
100% gas producer speed = 50970 rpm
(3) Up to 20 seconds duration approved for inadvertent use

4. Maximum Permissible Output Shaft Torque

	Torque Nm				
	30-Minute OEI	Take-off	Continuous	Transient 10 seconds	Transient 16 seconds
250-C18	397	397	338	434	–
250-C18A	397	397	338	434	–
250-C18C	397	397	338	434	–
250-C20	498	498	456	533	–
250-C20B	521	521	521	–	583
250-C20F	521	521	521	–	583
250-C20J	521	521	521	–	583
250-C20R	542	542	542	–	664
250-C20R/1	542	542	542	–	664
250-C20R/2	542	542	542	–	664
250-C20R/4	542	542	542	–	664
250-C20S	–	521	521	533	–
250-C20W	521	521	521	–	583
250-C300/A1	–	390	331	–	583(1)

(1) Up to 20 seconds duration approved for inadvertent use

5. Installation Assumptions

The installation assumptions are given in the applicable Installation Manual.

6. Time Limited Dispatch

Not applicable to engines with hydromechanical controls.

V. Operating and Service Instructions

	Operation and Maintenance Manual	Overhaul Manual	Installation Manual
250-C18	5W2	5W3	5W5
250-C18A	5W2	5W3	5W5
250-C18C	5W2	5W3	5W5
250-C20	10W2	10W3	10W5
250-C20B	10W2	10W3	10W5+SupplA
250-C20F	10W2	10W3	10W5F
250-C20J	10W2	10W3	10W5J
250-C20R	CSP21007	GTP5232-3	GTP5232-5
250-C20R/1	CSP21007	GTP5232-3	GTP5232-5
250-C20R/2	CSP21007	GTP5232-3	GTP5232-5
250-C20R/4	CSP21007	GTP5232-3	GTP5232-5
250-C20S	10W2	10W3	10W5S
250-C20W	10W2	10W3	10W5W
250-C300/A1	CSP21009	CSP21009	CSP24013

VI. Notes

1. Life limits for critical components are published in the EASA-approved Airworthiness Limitations Section (chapter 5) of the applicable Operation and Maintenance Manual.

2. For engines with Honeywell control systems, the installation must incorporate a control system stability accumulator in accordance with the applicable Installation Manual.

3. Optional Auto Reignition Control Kits are available for use with certain models. Consult the applicable Installation Manual for details.

4. Except for the 250-C18, 250-C18A and 250-C18C, a magnetic oil drain plug (chip detector) lamp is an installation requirement. Consult the applicable Installation Manual for details.

5. A 3 to 25 micron absolute external scavenge oil filter is an installation requirement for the 250-C20R, 250-C20R/1, 250-C20R/2, 250-C20R/4, 250-C20S and 250-C20W. Consult the applicable Installation Manual for details.

6. Conversion from military use.

   Model 250 Series II engines originally assembled by Rolls-Royce Corporation may have been in service with military operators. (Most Model 250 Series II engines delivered to the U.S. military have both the military model designation and the corresponding civil model designation on the data plate.) Before such engines can be converted to civil operation, their compliance with the European rules enabling issuance of an aircraft standard certificate of airworthiness must be checked. Their configuration, including design changes and repairs, does not necessarily conform to the type definition approved by EASA, and it is possible that in operation they have exceeded the limits approved by EASA. Before a standard certificate of airworthiness is issued to an aircraft in which such an engine is installed, or for an existing certificate of airworthiness to remain valid following installation of such an engine, an EASA Form 1 must be issued for the engine. This requires evaluation of the engine to ensure that it conforms to the approved type design, was manufactured under an approved production system, was operated within the approved limits and is in a condition for safe operation.

SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

N/A

II. Type Certificate Holder Record

Rolls-Royce Corporation

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	22 June 2011	Initial Issue	22 June 2011
Issue 02	5 June 2019	Addition of the 250-C18C model	5 June 2019

-END-

