

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION TYPE CERTIFICATE DATA SHEET E34NE	TCDS NUMBER E34NE REVISION: 8 DATE: November 30, 2016 SAFRAN HELICOPTER ENGINES MODELS: ARRIUS 1A ARRIUS 2F ARRIUS 2B1 ARRIUS 2K1 ARRIUS 2B1A ARRIUS 2B2 ARRIUS 1A1 ARRIUS 2R
---	--

Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E34NE) 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 (TC) HOLDER Safran Helicopter Engines, S.A.
 (formerly Turbomeca S.A.)
 64 511 Bordes
 France

I. MODELS	ARRIUS 1A	ARRIUS 2B1	ARRIUS 2B1A		ARRIUS 2F	ARRIUS 2K1	ARRIUS 2B2	ARRIUS 1A1
TYPE	Twin spool (free turbine engine); turboshaft engine for helicopters; single stage centrifugal compressor; annular reverse flow combustion chamber; single gas generator turbine; single stage power turbine (free turbine); reduction gearbox.							
			w/o TU45*	w/ TU45*				
RATINGS (See NOTE 8)								
30 sec OEI	---	---	---	---	---	---	747(557)	---
2 min OEI	---	---	---	---	---	---	730(554)	---
2 1/2 minute OEI shp (kw)	520(388)	577(430)	658(491)	705(526)	---	676(504)	---	556(415)
Continuous OEI	479(357)	577(430)	613(457)	498(371)	---	676(504)	650(485)	518(386)
30 minute OEI shp (kw)	479(357)	---	---	---	---	---	---	518(386)
Takeoff shp (kw)	456(340)	577(430)	613(457)	498(371)	432(322)	676(504)	644(480)	460(343)
Maximum continuous shp (kw)	397(296)	547(408)	547(408)	414(309)	432(322)	579(432)	579(432)	409(305)

* See Note 23

FUEL (See NOTE 15)

FUEL CONTROL

Turbomeca full authority digital electronic control system with manual backup mode for the Arrius 1A, Arrius 1A1, Arrius 2B1 and Arrius 2B1A and Arrius 2K1. For the Arrius 2F the fuel control system is ensured by a hydromechanical control with manual mode.

OIL (See NOTE 14)

PRINCIPAL DIMENSIONS

	ARRIUS 1A	ARRIUS 2B1	ARRIUS 2B1A	ARRIUS 2F	ARRIUS 2K1	ARRIUS 2B2	ARRIUS 1A1
Length, in (mm)	63(1601)	45.6(1158)	--	--	55.9(1418)	38.3(973)	63(1601)
Width, in (mm)	17.2(436)	20.4(518)	--	--	19.3(488)	21.2(538)	17.2(436)
Height, in (mm)	23.4(586)	27.2(690)	--	--	26.6(674)	25.1(638)	23.4(586)

*

PAGE	1	2	3	4	5	6	7	8	9	10	11
REV.	8	8	8	8	8	8	8	8	8	8	8

LEGEND: "--" INDICATES "SAME AS PRECEDING MODEL"

"---" INDICATES "DOES NOT APPLY"

NOTICE: ALL PAGES ARE REFORMATTED. SIGNIFICANT CHANGES, IF ANY ARE BLACK-LINED IN THE LEFT MARGIN.

I. MODELS	ARRIUS 2R																																							
TYPE	The ARRIUS 2R has an annular air intake, a single centrifugal compressor driven by a single stage gas generator turbine, an annular reverse flow combustion chamber, and a single stage free turbine with a through shaft driving a reduction gearbox located in the front. The reduction gear unit also includes the accessory gearbox driven by the gas generator.																																							
RATINGS (See NOTE 8) 30 sec OEI rating 2 min OEI rating 2 1/2 minute rating shp (kw) Continuous OEI rating 30 minute rating shp (kw) Takeoff shp (kw) Maximum continuous shp (kw)	With torque and fuel flow limitations	Without torque and fuel flow limitations																																						
	472(352) 433(323)	505(377) 460(343)																																						
FUEL (See NOTE 15) FUEL CONTROL	The Arrius 2R has a dual-channel electronic engine control system with auxiliary fuel metering back-up control.																																							
OIL (See NOTE 14) PRINCIPAL DIMENSIONS Length, in (mm) Width, in (mm) Height, in (mm)	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td data-bbox="477 898 737 928"></td> <td data-bbox="737 898 850 928"></td> <td data-bbox="850 898 964 928"></td> <td data-bbox="964 898 1078 928"></td> <td data-bbox="1078 898 1192 928"></td> <td data-bbox="1192 898 1305 928"></td> <td data-bbox="1305 898 1419 928"></td> <td data-bbox="1419 898 1572 928"></td> </tr> <tr> <td data-bbox="477 928 737 957">36.8(934)</td> <td data-bbox="737 928 850 957"></td> <td data-bbox="850 928 964 957"></td> <td data-bbox="964 928 1078 957"></td> <td data-bbox="1078 928 1192 957"></td> <td data-bbox="1192 928 1305 957"></td> <td data-bbox="1305 928 1419 957"></td> <td data-bbox="1419 928 1572 957"></td> </tr> <tr> <td data-bbox="477 957 737 987">21.8(553)</td> <td data-bbox="737 957 850 987"></td> <td data-bbox="850 957 964 987"></td> <td data-bbox="964 957 1078 987"></td> <td data-bbox="1078 957 1192 987"></td> <td data-bbox="1192 957 1305 987"></td> <td data-bbox="1305 957 1419 987"></td> <td data-bbox="1419 957 1572 987"></td> </tr> <tr> <td data-bbox="477 987 737 1016">26.6(676)</td> <td data-bbox="737 987 850 1016"></td> <td data-bbox="850 987 964 1016"></td> <td data-bbox="964 987 1078 1016"></td> <td data-bbox="1078 987 1192 1016"></td> <td data-bbox="1192 987 1305 1016"></td> <td data-bbox="1305 987 1419 1016"></td> <td data-bbox="1419 987 1572 1016"></td> </tr> </table>																36.8(934)								21.8(553)								26.6(676)							
36.8(934)																																								
21.8(553)																																								
26.6(676)																																								

CENTER OF GRAVITY WEIGHT (dry)

Refer to Installation Manual.

pounds (kg), maximum

ARRIUS 1A	ARRIUS 2B1	ARRIUS 2B1A	ARRIUS 2F	ARRIUS 2K1	ARRIUS 2B2	ARRIUS 1A1
223.3 (101.3)	246.9 (112)	246.9 (112)	229.3 (104)	248.7 (112.8)	246.9 (112)	223.3 (101.3)

Refer to Installation Manual, for definition of engine dry weight.

DRIVE SHAFT TYPE

Refer to Installation Manual.

CENTER OF GRAVITY WEIGHT (dry)

Refer to Installation Manual.

pounds (kg), maximum

ARRIUS 2R						
264.3 (119.9)						

Refer to Installation Manual, for definition of engine dry weight.

DRIVE SHAFT TYPE

Refer to Installation Manual.

IGNITION

- Low tension, high energy system including:
- Twin output (one high energy generator)
 - 2 injectors
 - 2 ignitors

CERTIFICATION BASIS

14 CFR 21.29 and 14 CFR part 33 effective February 1, 1965, and Amendments 33-1 through Amendment 33-12 for the ARRIUS 1A and 1A1. The ARRIUS 2B1, 2B1A and 2F, 2K1, 2B2 comply with Amendments 33-1 through 33-14, and Amendment 33-15 § 33.28 and Amendment 33-18 § 33.88 for ARRIUS 2B1A, 2K1, 2B2.

The ARRIUS 2R complies with 14 CFR 21.29 and 14 CFR part 33, effective February 1, 1965, Amendments 33-1 through 33-33 except: 14 CFR 33.14, Amendment 33-14 for the centrifugal compressor impeller, the power turbine disk, and the power turbine shaft; 14 CFR §§ 33.63 and 33.83, Amendment 33-14 for the whole engine; 14 CFR 33.27, Amendment 33-14 for the whole engine. Turbomeca elected to comply, for the ARRIUS 2R, with 14 CFR part 34, Amendment 5a, effective October 23, 2013, for fuel venting only (14 CFR 34.11).

Type Certificate Number E34NE, issued November 8, 1990.

Model Number	Effective Date of TC Application	Date Model Added to TC
ARRIUS 1A	December 21, 1989	November 8, 1990
ARRIUS 2F	November 25, 1996	September 26, 1997
ARRIUS 2B1	April 14, 1997	November 24, 1997
ARRIUS 2K1	June 20, 1997	July 20, 2001
ARRIUS 2B1A	April 6, 1999	July 20, 2001
ARRIUS 2B2	February 16, 2001	November 22, 2002
ARRIUS 1A1	June 17, 2007	December 19, 2007
ARRIUS 2R	November 4, 2015	November 30, 2016

The ARRIUS 2B has been deleted from the Type Certificate as of July 20, 2001. All Arrius 2B engines were retrofitted to ARRIUS engine model 2B1

Direction Generale de l'Aviation Civile (DGAC) originally type certificated this engine under its type certificate Number M20 The FAA validated this product under U.S. Type Certificate Number E34NE. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf of France.

IMPORT REQUIREMENTS

To be considered eligible for installation on U.S. registered aircraft, each new engine to be exported to the United States with the DGAC or EASA airworthiness approval shall have a EASA Form 1, Authorized Release Certificate. The EASA Form 1 should state that the engine conforms to the type design approved under the U.S. Type Certificate E34NE, is in a condition for safe operation, and has undergone a final operational check.

NOTES

NOTE 1. Permissible Engine Speeds:**A. Maximum gas generator speed, rpm (Ng)**

	<u>ARRIUS</u> <u>1A</u>	<u>ARRIUS</u> <u>2B1</u>	<u>ARRIUS</u> <u>2B1A</u>	<u>ARRIUS</u> <u>2F</u>	<u>ARRIUS</u> <u>2K1</u>	<u>ARRIUS</u> <u>2B2</u>	<u>ARRIUS</u> <u>1A1</u>	<u>ARRIUS</u> <u>2R</u>
2 1/2 minute rating	56,140	56,113	--	55308	56113	---	56347	---
OEI continuous rating	---	54,706	--	---	54706	---	---	---
30 minute rating	55,300	---	---	---	---	---	55452	---
Takeoff rating	54,685	54,706	--	54,658	54706	54105	54375	54872
Maximum continuous	53,285	53,406	--	53,847	53406	53564	53397	54066
Transient overspeed (5 sec. Limit)	56,280	56,823	--	56,065	56823	55187	56498	56065
30 sec	---	---	---	---	---	57081	---	---
2 minute	---	---	---	---	---	56413	---	---
Minimum stabilized speed	35176	35176	35176	34094	32470	32470	35176	34094

Refer to Installation Manual for variation of these limits with ambient conditions.

Refer to Installation Manual or Maintenance Manual for required action if limits are exceeded.

100% = 54,117 rpm

B. Power Shaft Speeds (Percent)

	<u>ARRIUS</u> <u>1A</u>	<u>ARRIUS</u> <u>2B1</u>	<u>ARRIUS</u> <u>2B1A</u>	<u>ARRIUS</u> <u>2F</u>	<u>ARRIUS</u> <u>2K1</u>	<u>ARRIUS</u> <u>2B2</u>	<u>ARRIUS</u> <u>1A1</u>	<u>ARRIUS</u> <u>2R</u>
Maximum stabilized	104	105	--	104	106	106	104	105
Maximum transient (5 sec.)	108	108	--	110	112	108	108	112
Minimum stabilized	91	94	94	92	90	94	91	94
Maximum inadvertent transient overspeed in minimum N ₂ flight mode				90 (20 sec.)				92 (20 sec.)

During starting, operation within the 70 to 85% range (ARRIUS 1A & ARRIUS 1A1), and 75 to 85% range (ARRIUS 2B1, ARRIUS 2B1A and ARRIUS 2K1) is limited to 20 seconds.

100% power turbine speed = 45,438 rpm (ARRIUS 1A & ARRIUS 1A1), 44,038 rpm (ARRIUS 2B1, ARRIUS 2B1A, and ARRIUS 2B2), 44,009 rpm (ARRIUS 2K1 and ARRIUS 2F), and 42,014 rpm (ARRIUS 2R).

100% output shaft speed = 6,016 rpm (ARRIUS 1A & ARRIUS 1A1), 5,898 rpm (ARRIUS 2B1 and ARRIUS 2B1A), 6,252 rpm (ARRIUS 2B2), 6000 rpm (ARRIUS 2F and ARRIUS 2K1), 5610 rpm (ARRIUS 2R).

Refer to Installation Manual or Maintenance Manual for required action if limits are exceeded.

NOTE 2. Maximum Permissible Temperatures:**A. Exhaust Gas T45(°C)**

(measured with 4 doubles thermocouples on gas generator turbine diffuser)

	<u>ARRIUS</u> <u>1A</u>	<u>ARRIUS</u> <u>2B1</u>	<u>ARRIUS</u> <u>2B1A</u>	<u>ARRIUS</u> <u>2F</u>	<u>ARRIUS</u> <u>2K1</u>	<u>ARRIUS</u> <u>2B2</u>	<u>ARRIUS</u> <u>1A1</u>	<u>ARRIUS</u> <u>2R</u>
2 1/2 minute OEI rating	870	945	--	---	957	---	886	---
2 minute OEI rating	---	---	---	---	---	794	---	---
30 second OEI rating	---	---	---	---	---	1024	---	---
OEI continuous rating	---	895	--	---	905	942	---	---
30 minute OEI rating	800	---	---	---	---	---	812	---
Takeoff rating	800	895	--	870	905	897	773	865
Maximum continuous Rating	765	855	--	830	866	879	749	829
Starting (unlimited)	765	810	--	800	810	819	765	800
Starting (limited to ≤ 5 sec.)	870	895	--	870	895	910	870	870

(10 sec.)

Refer to Installation Manual or Maintenance Manual for required action if limits are exceeded.
See Note 26 for maximum overtemperature limits.

- NOTE 2. (Cont'd)** B. Oil (°C) (measured at location defined in the Installation Manual):
- Maximum operating: 80 to 110 depending on altitude and type of fuel (ARRIUS 1A & ARRIUS 1A1), 110 (ARRIUS 2F, ARRIUS 2B1, ARRIUS 2B1A, ARRIUS 2K1, ARRIUS 2B2) 110 (ARRIUS 2R)
 - Minimum for starting: For all models except ARRIUS 2F and ARRIUS 2R: between -50 and -30; Refer to Installation Manual.
For ARRIUS 2F:
For 5 mm²/s and 3.9 mm²/s oil: -30
For 3 mm²/s oil: -50
For ARRIUS 2R:
For 5 mm²/s and 4 mm²/s oil: -30
For 3 mm²/s oil: -50
 - Minimum for power application: For all models except ARRIUS 2F and ARRIUS 2R: between 0 and 10, according to oil specifications. See Installation Manual for further details.
For ARRIUS 2F:
For 5 mm²/s and 3.9 mm²/s oil: 10 (transient condition) and 50 (continuous operation).
For 3 mm²/s oil: 0 (transient condition) and 50 (continuous operation).
For ARRIUS 2R:
For 5 mm²/s and 4 mm²/s oil: 10 (transient condition) and 50 (continuous operation).
For 3 mm²/s oil: 0 (transient condition) and 50 (continuous operation).

Fuel (°C) (at engine inlet):

Maximum operating +50 (see NOTE 20) for ARRIUS 1A, and ARRIUS 1A1. For ARRIUS 2F, ARRIUS 2B1, ARRIUS 2B1A, ARRIUS 2B2, ARRIUS 2K1, and ARRIUS 2R, refer to the Installation Manual.
Minimum for starting: The fuel temperature conditions for engine starting are specified in the Installation Manual.
Use anti-icing additive when fuel temperature is below -15 for ARRIUS 2F and below -20 for ARRIUS 2R. All other models, refer to Installation/Operating Manual.
Refer to Installation Manual for the definition of normal and restricted fuels for the ARRIUS 2F and ARRIUS 2R.

NOTE 3. Power Turbine Unit Torque Limits ft. lb. (Nm):

	ARRIUS 1A	ARRIUS 2B1	ARRIUS 2B1A		ARRIUS 2F	ARRIUS 2K1	ARRIUS 2B2	ARRIUS 1A1
			w/o TU45*	w/ TU45*				
- Max., 2 1/2 min OEI	501.5 (680)	582.7 (790)	586 (795)	628(852)	582.7 (790)	612.2 (830)	---	501.5 (680)
- Max. OEI continuous	---	545.8 (740)	--	443(600)	---	560.6 (760)	546(740)	---
- Max. 30 min. OEI	464.7 (630)	---	---	---	---	---	---	464.7 (630)
- Max., takeoff	464.7 (630)	545.8 (740)	--	443(600)	479.5 (650)	560.6 (760)	546(740)	464.7 (630)
- Max., max. continuous	413.0 (560)	486.8 (660)	--	369(500)	442.6 (600)	501.5 (680)	486.8(660)	413.0 (560)
- Transient (20 sec.)	568 (770)	612.2 (830)	--	668(905)	554.7 (752)	708.8 (961)	---	568 (770)
- 30 sec	---	---	---	---	---	---	667.4(905)	---
- 2 minute	---	---	---	---	---	---	667.4(905)	---
	ARRIUS 2R							
- Max., 2 1/2 min OEI	---							
- Max. OEI continuous	---							
- Max. 30 min. OEI	---							
- Max., takeoff	442.5(600)							
- Max., max. continuous	405.7(550)							
- Transient (5 sec.)	486.8(660)							

* See Note 23

NOTE 4.

Fuel and Oil Pressure Limits, psig (bar):

A. Fuel: For all models except ARRIUS 2R: refer to Installation Manual. For ARRIUS 2R: within starting or relight phase and above 2000m altitude, a prime pump is necessary. This shall maintain a relative pressure equal to or greater than 25 kPA. The maximum fuel system inlet pressure is 110 kPA relative to atmospheric pressure.

B. Oil: (measured at engine pump outlet after filter)

	<u>ARRIUS 1A</u>	<u>ARRIUS 2B1/2B1A</u>	<u>ARRIUS 2K1</u>	<u>ARRIUS 2B2</u>	<u>ARRIUS 1A1</u>
Maximum:	145.1 (10)	145.1 (10)	217.7 (15)	145.1 (10)	145.1 (10)

	<u>ARRIUS 2F</u>	<u>ARRIUS 2R</u>
Maximum differential:	217.6 (15)	217.6 (15)

(refer to Installation Manual or Maintenance Manual if limit is exceeded).

	<u>ARRIUS 1A</u>	<u>ARRIUS 2B1/2B1A</u>	<u>ARRIUS 2K1</u>	<u>ARRIUS 2B2</u>	<u>ARRIUS 1A1</u>
Minimum at N ₁ greater than percent stated below:					
65%:	24.7(1.7)	68%: 24.7(1.7)	60%: 18.85(130)	65%: 24.7(1.7)	65%: 24.7(1.7)

	<u>ARRIUS 2F</u>	<u>ARRIUS 2R</u>
Minimum differential:	24.7(1.7)	*

* See Installation Manual.

NOTE 5.

Maximum Permissible Air Bleed:

(P3 air bleed from centrifugal compressor plenum)

- Maximum air mass flow: 0.15 lb/sec. (ARRIUS 1A/1A1), at take-off rating under standard sea level conditions (Refer to Installation Manual).

4.5% of engine inlet air mass flow (ARRIUS 2B1/2B1A)

5.48% of engine inlet air mass flow (ARRIUS 2K1/2B2).

ARRIUS 2F: Maximum air flow on one port and maximum total bleed air flow is 0.15 lb/sec.

ARRIUS 2R: One port maximum air flow is 0.15 lb/sec. Maximum total bleed air flow is 0.18 lb/sec on the two ports.

- Power loss due to air bleed: refer to Installation Manual or Performance Booklet.

NOTE 6.

Air Intake Requirements:

-The Arrius engines were not tested to evaluate the effects of foreign object ingestion. It is the Airframer's responsibility to protect the engine from foreign object ingestion through the design of the aircraft air intake. The aircraft manufacturer must substantiate that the aircraft air intake installation prevents foreign object ingestion by the engine, prior to the approval of the engine installation.

-The Arrius engines do not have anti-icing provisions. The Arrius 1A & Arrius 1A1 engines comply with the engine airworthiness requirements during icing conditions when Aerospatiale 335 N helicopter air intake Part Number (P/N) 335 A543533 is installed. The ARRIUS 2B1, 2B2, 2B1A, 2F and 2K1 engines comply with the engine airworthiness requirements during icing conditions without the aircraft air intake installed. Therefore, for the ARRIUS 2B1, 2B1A, 2F and 2K1 engines, prior to the approval of the engine installation, the aircraft manufacturer shall substantiate that the installation of the air intake does not impact engine operation during icing conditions. The ARRIUS 2R is approved to be fitted to rotorcraft when the installation precludes ingestion of hailstone and birds from entering the engine inlet.

NOTE 7. Accessory Drive Provisions:**ARRIUS 1A and 1A1**

Starter-generator output						
	Rotation direction	Rotation speed (RPM)	Maximum Continuous Mechanical Power, hp(kW)	Maximum torque at overload lb*ft(N*m)	Maximum static overhang moment lb*ft(N*m)	
	CW	11479	(*)	18.4(25)	18.4(25)	

Values correspond to 100% N_g. The rotation direction of the engine rotating components is indicated with respect to viewing the engine from the front to the rear. For further details, see Installation Manual.

* Maximum steady state mechanical off-take:

Arrius 1A: 4.8 kW at all ratings

Arrius 1A1:

Maximum continuous and take-off ratings: 3 kW without de-rating. If mechanical off-take is between 3 and 6 kW, corrections to performance and ratings stated in Performance Booklet X 319 U1 100 2 shall be applied, and it shall be limited to 4.8 kW if altitude is higher than 10,000 ft.

Continuous OEI rating: 4.8 kW without de-rating. If mechanical off-take is between 4.8 and 6 kW, corrections to performance and ratings stated in Performance Booklet X 319 U1 100 2 shall be applied, and it shall be limited to 4.8 kW if altitude is higher than 10,000 ft.

2 ½ minute OEI rating: 6 kW without de-rating, and limited to 4.8 kW if altitude is higher than 10,000 ft.

ARRIUS 2B1, 2B1A, 2B2, and 2K1

Starter-generator output						
Model	Rotation direction	Rotation speed (RPM)	Maximum torque in overload lb*ft(N*m)	Maximum static overhang moment lb*ft(N*m)	Fuse shaft breakaway torque, lb*ft(N*m)	
ARRIUS 2B1, 2B1A, and 2B2	CW	12334	18.4(25)	18.4(25)	70.1(95)	
ARRIUS 2K1	CW	12335	18.4(25)	5.2(7)	70.1(95)	
Spare drive						
ARRIUS 2K1	CW	4632	11.1(15)	11.1(11)	33.2(45)	

Values correspond to 100% N_g. The rotation direction of the engine rotating components is indicated with respect to viewing the engine from the front to the rear. For further details, see Installation Manual.

ARRIUS 2F and ARRIUS 2R

Starter-generator output						
Model	Rotation direction	Rotation speed (RPM)	Maximum torque in overload lb*ft(N*m)	Maximum static overhang moment lb*ft(N*m)	Fuse shaft breakaway torque, lb*ft(N*m)	Maximum Continuous Mechanical Power, hp(kW)
ARRIUS 2F	CW	12334	18.4(25)	18.4(25)	56.8(77)	7.6(5.7)
ARRIUS 2R	CW	12334	18.4(25)	18.4(25)	70.1(95)	9.2(6.9)

Values correspond to 100% N_g. The rotation direction of the engine rotating components is indicated with respect to viewing the engine from the front to the rear. For further details, see Installation Manual.

NOTE 8. Engine Ratings: Based on calibrated test rig with performance under the following conditions:

- Static, sea level standard conditions (59°F, 29.92 in. Hg).
- No airbleed, no accessory power extraction.
- output shaft drive speed: 6016 rpm (ARRIUS 1A/1A1), 5898 rpm (ARRIUS 2B1/2B1A), 6360 rpm (ARRIUS 2K1), 6252 (ARRIUS 2B2).
- Heating value of fuel = 18,550 BTU/lb.

For the ARRIUS 2F:

The performance values specified correspond to minimum values defined under the following conditions:

- ISA conditions at sea level, on test bed
- Engine equipped with a test bed air flow measurement intake plenum and a test bed exhaust jet pipe
- No air bleed
- No power drawn by any accessories other than those required for engine operation
- Power off-take speed = 6000 RPM constant
- Usual fuel heating value = 18,550 Btu/lb
- Alternative fuel heating value = 18,702 Btu/lb

For the ARRIUS 2R:

The performance values specified correspond to minimum values defined under the following conditions:

- Neither pressure drop nor heating, nor swirl, at engine inlet plane 1 (see Installation/Operating Manual §2.2 for reference plane definition)
- Atmospheric humidity used for performance calculation: Humidity Mixing Ratio = 0.0069 (65% relative humidity at sea level and 59 °F)
- Engine equipped with a test bed air flow measurement intake plenum and a test bed exhaust jet pipe.
- No back pressure downstream of the test bed exhaust pipe plane 7
- No air bleed
- No electrical power off-take
- No power drawn by any accessories other than those required for engine operation
- Output shaft rotation speed 100% = 5610 RPM constant
- Fuel heating value = 18,550 Btu/lb
- No fuel flow limit

The indicated ratings are minimum final test performance of production and overhaul engines in accordance with engine acceptance test specification Number 0.319.00.940.0 (ARRIUS 1A/1A1), 0.319.00.958.0 (ARRIUS 2B1/2B1A), 0319.00959.0 (ARRIUS 2F), 0.319.00.962 (ARRIUS 2K1), 0.319.00.967.0 (ARRIUS 2B2).

NOTE 9. Reserved.

NOTE 10. Oil Systems: Refer to Installation Manual.

NOTE 11. Engine Monitoring Transmitters: Refer to Installation Manual.

NOTE 12. Electrical Equipment: Refer to Installation Manual.

NOTE 13. Engine Fire Detector:

Fire detectors provided on the engine: 4 (ARRIUS 1A/1A1), 2 (ARRIUS 2B1/2B1A/2B2), and 3 (ARRIUS 2F)

NOTE 14. Refer to Installation Manual for approved oil specification.

NOTE 15. Refer to Installation Manual for approved fuel and additive specification.

NOTE 16. Life-limited components are listed in DGAC or EASA-approved Chapter 5 or Airworthiness Limitation Chapter/Section of the Engine Maintenance Manual.

NOTE 17. Manuals required by 14 CFR 33.4 and 33.5

	ARRIUS 1A	ARRIUS 2B1	ARRIUS 2B1A	ARRIUS 2F	ARRIUS 2K1	ARRIUS 2B2	ARRIUS 1A1
Installation/ Operating Manual	x319 D 0012	x319 L5 0012	x319 L5 0012	x319 L6 0012	x319 N1 0042	x319 n3 0012	x319 D6 0012
Maintenance Manual	x319 D 6300 1	x319 L5 3012	x319 L5 4512	x319 L6 3002	x319 N1 3002	x319 n3 4512	x319 U1 451 2
Overhaul Manual	x319 H6 5002	x319 L5 5002	x319 L5 5002	x319 L6 5002	x319 N1 5002	x319 n3 5002	x319 U1 5002
	ARRIUS 2R						
Installation/ Operating Manual	x319 R5 0032						
Maintenance Manual	x319 R5 4602*						
Overhaul Manual	x319 R5 5002*						

(*) Instructions for continued airworthiness for the Arrius 2R are incomplete. 14 CFR 21.50(b) requires the holder of this type certificate to ensure these instructions are complete and furnished prior to when the aircraft incorporating these engines are issued standard airworthiness certificates or delivered/returned to service, whichever occurs later. The Maintenance Technical Instruction are not ICA and are not FAA accepted.

Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or – for approvals made before September 28, 2003 – by the DGAC. Any such documents are accepted by the FAA and are considered FAA approved.

- Service bulletins,
- Structural repair manuals,
- Vendor manuals,
- Aircraft flight manuals, and
- Overhaul and maintenance manuals.

These approvals pertain to the type design only.

NOTE 18. Reserved.

NOTE 19. FADEC box (ARRIUS 1A, 1A1, 2B1, 2B1A, 2K1 and 2B2)

A. Installation conditions

The box shall be installed in the airframe outside the fire zone.
Refer to Installation Manual for other installation conditions.

B. Lightning protection: refer to Installation Manual.

C. Electromagnetic interferences: tests carried out are specified in the Installation Manual.

D. Software

The software has been developed and tested and the corresponding documentation developed according to the recommendations of documents RTCA DO 178A/EUROCAE ED-12A to level 1.

NOTE 20. ARRIUS 1A, ARRIUS 1A1: Maximum fuel temperature when operating with restricted use-fuels is +25°C. Maximum operating duration with restricted use fuels is 25 hours.

NOTE 21. The ARRIUS 1A, ARRIUS 1A1 and ARRIUS 2B1, 2B2, 2B1A and ARRIUS 2K1 engines are restricted to twin-engine rotorcraft applications.

- NOTE 22.** The ARRIUS 2B engine model is no longer in service and has been cancelled by the FAA from this data sheet as requested by the manufacturer.
- NOTE 23.** TU45 is a major non-significant software modification, which mainly increases the ARRIUS 2B1A 2 1/2 minute OEI power rating and reduces the other power ratings. When modification TU45 is applied on 2B1A, it is identified as "ARRIUS 2B1A__1" on the engine identification plate.
- NOTE 24.** ARRIUS 2F maximum oil tank volume is 1.29 gallons. ARRIUS 2F minimum oil tank volume is 0.79 gallons. The oil tank is not part of the engine type design for the ARRIUS 2R. The oil consumption limit for both ARRIUS 2F and ARRIUS 2R is 0.079 gallons/hour.
- NOTE 25.** The ARRIUS 2F and ARRIUS 2R have not been approved for time limited dispatch.
- NOTE 26.** The engine is approved for a maximum exhaust gas overtemperature for inadvertent use due to abnormal operation for the time periods stated without requiring rejection of the engine from service or maintenance action other than to correct the cause. The cause of the overtemperature must be investigated and corrected. The maximum overtemperature limit for the ARRIUS 2F is 900 °C for 5 seconds. The maximum overtemperature limit for the ARRIUS 2R is 882 °C for 20 seconds.

--END--