TYPE-CERTIFICATE DATA SHEET

No. E. 071

for
Astazou III series engines

Type Certificate Holder

Safran Helicopter Engines

64510 Bordes
France

For Models:

Astazou III A

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I. General

1. Type/ Model

Astazou III A

2. Type Certificate Holder

Safran Helicopter Engines
64510 Bordes
France

DOA-ref: EASA.21J.070

Until 18 July 2016 Turbomeca
After 18 July 2016 Safran Helicopter Engines

3. Manufacturer

Until 18 July 2016 Turbomeca
After 18 July 2016 Safran Helicopter Engines

4. Date of Application

07 December 1970

Note: The present type certificate data sheet cancels and replaces DGAC-F TCDS n° M6. The Type Certificate for the Astazou III A2 variant had been surrendered on 11 October 2005 and is excluded.

5. EASA Type Certification Date

07 June 1972
(initially DGAC-F Type Certificate Data Sheet n°M 6)

II. Certification Basis

1. EASA Certification Basis

1.1. Airworthiness Standards

General Technical Conditions CTG 001 Issue 1 dated 30 June 1969, based on BCAR, Section C, Issue 6 plus 21 amendments (Blue Papers), i.e. equivalent to Issue 7.c

1.2. Special Conditions (SC)

none

1.3. Equivalent Safety Findings

none

Note: The engines are approved for use on single-engine civil helicopters, at the ratings and operating limits specified below, provided that the powerplant installation regulations applicable to the helicopter on which the engines are installed are observed.

1.4. Deviations

none

III. Technical Characteristics

1. Type Design Definition

- Complete engine part list	0 268 08 501 0
- Bare engine part list	0 268 08 000 0
- Fuel control equipment list	0 268 92 504 0
- Equipment list	0 268 85 504 0
- Definition of interfaces, installation drawing	0 268 06 900 0

2. Description

The Astazou III A is a single spool engine with an annular air intake, one stage axial compressor, a single stage centrifugal compressor, an annular combustion chamber and a three stage axial turbine. A co-axial reduction gearbox, housed in the hub of the air intake, provides a drive for a splined transmission shaft to the helicopter principal gear box.

3. Equipment

included in Type Design Definition

4. Dimensions

Overall Length	1.434 m
Overall Height	0.508 m
Width	0.483 m

5. Dry Weight

147.5 kg

6. Ratings

RATING	Rotation speed (rpm)	Shaft power (kW)
Maximum once per hour (take off)	43 500	440
Maximum continuous	43 500	440

The minimum guaranteed power values indicated in the above table are defined under the following conditions:

Static, sea level standard conditions (15 °C, 1 013 mbar);
At the engine test bed with hydraulic brake system;
With the air bleed ports closed;
Without accessory power extraction;
With calibrated Safran Helicopter Engine air intake duct P/N 6 202 74 715 0;
With straight cylindrical exhaust pipe P/N 6 103 33 728 0, outlet area 531 cm^2.

The performance curves are given in the Operation Manual of the engine.

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

See Operations Manual

8. Aircraft Accessory Drives

Accessory	Direction of rotation (1)	Reduction ratio Nominal speed	Maximum steady state shaft power kW	Maximum torque daNcm	Maximum static overhung load (2) daNcm
Starter-generator	CW	5.571294 7 807.8 rpm	7.5	1 000	250
AC generator	CW	3.63468 11 968 rpm	12.00	335	150
Tachometer transmitter	CW	10.38481 4 188.8 rpm	0.1	5	10
Fuel pump and control unit (3)	CCW	10.9417 3 975.6 rpm	-	-	-
Oil pump (3)	CW	11.4506 3 798.9 rpm	-	-	-

NOTE:(1) The direction of rotation is given as viewed from outside, from the rear of the engine or the accessory-holder, looking forward.(CW : clockwise, CCW : counter clockwise)
(2) Load exerted by the weight of the accessory overhung on the drive pad.
(3) Internal accessory, integral engine part.

9. Maximum Permissible Air Bleed Extraction

P2 air bleed extraction (compressor outlet) for helicopter use.
Maximum air flow: 100 g/s.
Power loss due to air bleed extraction: 0.5 kW/g/s.

IV. Operating Limitations

1. Temperature Limits

Air temperature in the engine compartment

- In the front area = max. + 90 °C
- In the back area = max. + 130 °C

Minimum: - 55 °C
Maximum ground soak: + 70°C

Note: the separation plane between the front and the back area of the engine compartment is given by the turbine casing front flange.

Air intake temperature

The engine meets the ice and snow protection requirements up to - 40 °C when either Safran Helicopter Engine anti-icing shield no. 0 235 20 753 0 or no. 0 235 21 768 0, Safran Helicopter Engine air intake grid no. 0 235 21 762 0 or SNIAS silencer no. 341-A-54-0110 or no. 341-A-54-1004 is installed, and when the oil temperature is above + 30°C.
Exhaust gas temperature limits

Starting:	- Maximum temperature:	700 °C
	- Overtemperature:	750 °C (max. 5 s)

Operation:

At maximum once per hour	550 °C
- with silencer no. 341-A-54-1004	565 °C
At maximum continuous rating	550 °C
- with silencer no. 341-A-54-1004	565 °C
Maximum overtemperature (in case of emergency)	600 °C

(Refer to the Operation Manual for required action when these limits are exceeded)

Fuel Temperature

Minimum fuel temperatures:

- Starting: - 10 °C to - 30 °C depending on type of fuel.
- Operation: - 40 °C to - 50 °C depending on type of fuel.

Maximum operating temperatures:

+ 45 °C to + 70 °C depending on type of fuel.
Refer to the Operation Manual for details.

Oil Temperature (with oil having a kinematic viscosity of 3x 10-6 m2/s = 3 cSt).

- Minimum for power up: - 15 °C
- Maximum for operation: + 85 °C

Refer to the Operation Manual for starting and other limits depending on type of oil.

2. Pressure Limits

2.1 Fuel Pressure

Fuel pressure at engine inlet, starting: + 0.3 to + 0.6 bar
Fuel pressure at engine inlet, operation: - 0.3 to + 0.9 bar

Maximum fuel flow to be guaranteed for the fuel system: 300 dm3/h
Maximum fuel flow limited by the fuel control system: 230 dm3/h + 10, - 0 dm3/h

2.2 Oil Pressure

- Normal in operation: 1.5 to 5 bar
- Minimum at 43 500 rpm: 1.1 bar
- Minimum at ground idle: 0.39 bar

4. Electrical System:

Minimum supply voltage in electrical system before starting: 25 V

Minimum supply voltage to accessories (except starter) during starting: 15 V

Current consumption of the accessories (except starter) during starting:
Peak: 18 A Average over 10 s: 10 A

Current consumption of the starter:

Peak: 650 A Average over 25 s: 350 A

Generator: DC generation enabled at approx.: 30 000 rpm
maximum once per hour power during generator operation: 5 kW

5. Limit load factors, inclination:

Undisturbed operation under the following limit load factors:

- Along Z: + 0.5 g to + 4 g for an unlimited duration
  - 0.5 g to + 0.5 g for an unlimited number of 5 s periods, separated by periods of at least 30 s at + 0.5 g

- Along X and Y: 3 g

Acceptable load factors in crash-landing conditions: 10 g along Z and along X
5 g along Y

Acceptable inclination for successful start and undisturbed operation: 15° in all directions.

6. Vibration limits:

Normal amplitude, peak-to-peak, steady-state operating conditions: 15 microns
Maximum amplitude, peak-to-peak, steady-state operating conditions: 30 microns

Refer to the Operation Manual for details on vibration measurement.

7. Torque limits:

Maximum torque: 80.3 daNm (corresponds to 520 kW at 6 179 rpm).

8. Component life limits:

Service life-limited engine components are listed in Chapter 5 of the Maintenance and Overhaul Manuals.

9. Oil consumption:

Oil consumption, normal: 0.10 dm3/h, maximum: 0.50 dm3/h

Maximum permissible fuel dilution in oil: 10 % by volume

V. Operating and Service Instructions

Installation Manual	268 05 931
Operation Manual	268 05 932
Maintenance Manual	268 08 932
Service Letters and Service Bulletins	Refer to SB and SL directory
Overhaul Manual	268 08 935
Maintenance tools and spare parts catalogue	268 08 939

VI. Notes

The Operating / Starting envelope is defined in the Operation Manual.

Conversion from non-civil use.

Case 1: ASTAZOU III A engines originally assembled by Safran Helicopter Engine may have been in service with military, customs, police or other operators not under the jurisdiction of a civil Authority. This is known to apply to, but is not limited to, engines installed in the Eurocopter SA 341 G GAZELLE helicopter.

Case 2: ASTAZOU III A engines can be created by converting ASTAZOU III B engines. The ASTAZOU III B is a military variant of the ASTAZOU III A, known to be installed in, but not limited to, a military variant of the Eurocopter SA 341 G GAZELLE helicopter.

The compliance of Case 1 and Case 2 engines 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 a Case 1 or Case 2 ASTAZOU III A turboshaft engine is installed, an EASA Form 1 must be issued for the engine. This requires incorporation of Safran Helicopter Engine Mandatory Service Bulletin A268 72 0801, Original Issue (or any subsequent approved issue) for Case 1 engines, and Mandatory Service Bulletin A268 72 0803, Original Issue (or any subsequent approved issue) for Case 2 engines.

SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

n/a

II. Type Certificate Holder Record

Until 18 July 2016 Turbomeca
After 18 July 2016 Safran Helicopter Engines

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	25 January 2006	Initial Issue	Initial Issue, 01 June 1972 EASA TC: 25.01.2006
Issue 02	19 November 2007		
Issue 03	21 April 2009		
Issue 04	01 August 2016	Name change from Turbomeca to Safran Helicopter Engines	01 August 2016

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