TYPE-CERTIFICATE DATA SHEET

No. E.074

for
Turmo IV series engine

Type Certificate Holder

Safran Helicopter Engines

64510 Bordes
France

For Models:

TURMO IV C

Intentionally left blank

TABLE OF CONTENTS

I. General

1. Type/Models:

TURMO IV C. This model is approved for use on 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.

2. Type Certificate Holder:

Safran Helicopter Engines
64510 Bordes
France

DOA-ref: EASA.21J.070

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

3. Manufacturer:

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

4. EASA Certification Application Date:

Not identified (before 30 October 1973)

5. EASA Certification Reference Date:

30 June 1969

6. EASA Certification Date:

30 October 1973

Note: The present data sheet cancels and replaces the data sheet “Fiche de caractéristiques moteur N° M8” issued by the French Direction Générale de l’Aviation Civile (DGAC-F). The DGAC-F data sheet also included the TURMO IV A, which is not included in the present data sheet because the associated Type Certificate will be revoked following its surrender by SAFRAN HELICOPTER ENGINES

II. Certification Basis

1. Certification Specifications:

General Technical Conditions CTG 001, dated 30 June 1969

Note: CTG 001 was issued by the DGAC-F and was based on Section C of the British Civil Airworthiness Requirements.

2. Special Conditions:

None.

3. Deviations:

None.

4. Equivalent Safety Findings:

None.

5. Environmental Protection Requirements:

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

Note: Environmental protection requirements were not part of the original certification basis but compliance is required in accordance with Article 6 of Regulation (EC) 216/2008 of the European Parliament and of the Council. A statement of compliance was provided by Safran Helicopter Engines on 17 March 2011.

III. Technical Characteristics

1. Type Design Definition:

The Type Design Definition is in accordance with the following SAFRAN HELICOPTER ENGINES Drawings.

Complete Engine	Bare Engine	Fuel Control Equipment	Engine Equipment
0 279 00 507 0	0 279 02 502 0	0 249 72 501 0	0 279 85 505 0

2. Description:

The TURMO IV C is a free power turbine turboshaft engine. The gas generator consists of a single-stage axial and single-stage centrifugal compressor driven by a two-stage axial turbine, and an

annular combustion chamber with radial fuel injection by means of a rotating injection wheel. The free power turbine consists of a single axial stage. It is coupled directly to the output shaft.

3. Equipment:

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

4. Dimensions:

Length (mm)	Height (mm)	Width (mm)
2 184	719	637

5. Dry Weight:

Dry weight (completely equipped, excluding the exhaust pipe): 230 kg (-0/+5 kg)

6. Ratings:

Rated shaft power in kW(1)

Maximum Contingency (2½ minutes)	Intermediate Contingency (unlimited)	Take Off (5 minutes)	Maximum Continuous
1 160	1 100	1 115	960

(1) Minimum values defined under the following conditions:

- sea level standard day (ISA) conditions (15 °C, 1 013 mbar);
- on the engine test bed with a hydraulic brake system;
- with the air bleed ports closed;
- with no accessory power extraction;
- with calibrated Safran Helicopter Engines air intake duct P/N 6 202 66 701 0;
- with Safran Helicopter Engines exhaust pipe P/N 0 249 76 000 0.

Performance curves are available in the Operation Manual.

7. Control System:

The engine has a hydromechanical control system.

8. Fluids (Fuel/Oil/Additives):

8.1 Fuel

For a list of fuels and fuel additives approved for use in the engine, consult the Operation Manual.

8.2 Oil

For a list of oils approved for use in the engine, consult the Operation Manual.

9. Aircraft Accessory Drives:

Accessory	Direction of Rotation	Reduction Ratio / Nominal Speed	Maximum Steady State Torque Nm	Maximum Transient Torque Nm	Maximum Static Overhung Moment(2) Nm
Tachometer transmitter (free power turbine)	Counter-clockwise(1)	3.81419 / 5988 rpm	0.2	1.0	3.0

(1) As viewed from the outside, looking at the accessory drive pad
(2) Moment exerted by the weight of the accessory overhung on the drive pad

10. Bleed Extraction:

Limitations on the use of air bleed are defined in the Operation Manual.

Maximum bleed air temperature:	280 °C
Maximum bleed air pressure:	520 kPa
Maximum bleed air flow rate:	180 g/s (engines equipped with 15.2 mm diameter off-take)
	250 g/s (engines equipped with 18.0 mm diameter off-take)
Power loss:	0.4 kW/g/s (engines equipped with 15.2 mm diameter off-take)
	0.5 kW/g/s (engines equipped with 18.0 mm diameter off-take)

IV. Operational Limitations

1. Temperature Limits:

1.1 Gas Generator Exhaust Temperature (T4) Limits

Starting (limited to 30s):	750 °C
Maximum Contingency:	790 °C 820 °C with bleed air for anti-icing (refer to the Operation Manual)
Intermediate Contingency:	770 °C
Take-off:	780 °C
Maximum Continuous:	710 °C
Transient (limited to 12s):	830 °C

1.2 Fuel Temperature

Minimum for starting:	refer to the Operation Manual
Maximum in Operation:	50 °C

1.3 Oil Temperature

Minimum for starting:	refer to the Operation Manual
Minimum for engine loading:	0°C
Maximum in operation:	100°C
Minimum for anti-icing effectiveness:	30°C

2. Maximum/Minimum Speeds:

2.1 Gas Generator

Maximum Contingency:	33 800 rpm
Intermediate Contingency:	33 350 rpm
Take-off:	33 450 rpm
Maximum Continuous:	32 500 rpm
Maximum over-speed (limited to 12s):	34 672 rpm
Minimum for anti-icing effectiveness:	26 000 rpm (between -20°C and +5°C outside air temperature) 26 500 rpm (below -20°C outside air temperature)

2.2 Power Turbine / Output Shaft

Nominal:	22 840 rpm (±50 rpm)
Maximum:	23 750 rpm 26 750 rpm (engines incorporating modification TU143)

Operation with the power turbine locked is authorised for 5 minutes provided that the gas generator speed is below 21 600 rpm.

3. Pressure Limits:

3.1 Fuel Pressure

Pressure (gauge) at engine inlet for starting: +30 to +80 kPa
Pressure (gauge) at engine inlet in operation: -40 to +120 kPa

3.2 Oil Pressure

Minimum at ground idle (gauge): +70 kPa
Minimum in operation (gauge): +200 kPa
Maximum at take-off (gauge): +450 kPa

4. Installation Assumptions:

Refer to the Installation Manual.

5. Time Limited Dispatch:

Not applicable to engines with hydromechanical controls.

V. Operational and Service Instructions

Installation Manual	Operation Manual	Maintenance Manual	Overhaul Manual
249 92 932	279 00 936	279 02 931	249 92 933

For Service Letters and Service Bulletins, refer to the SL and SB directory.

VI. Notes

1. Life-limited engine components and associated requirements are listed in the EASA-approved Airworthiness Limitations Section, Chapter 5, of the Maintenance and Overhaul Manuals.

2. Conversion from non-civil use:

   This note is applicable to the following cases:

   Case 1: TURMO IV C engines originally assembled by Safran Helicopter Engines may have been in service with military, customs, police or other operators not under the jurisdiction of a civil Authority.

   Case 2: TURMO IV C engines can be created by converting TURMO IV B engines. The TURMO IV B is a military model.

Case 3: TURMO IV C engines can be created by converting TURMO III C4 engines. The TURMO III C4 is a military model.

The compliance of Case 1, Case 2 and Case 3 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, Case 2 or Case 3 TURMO IV C turboshaft engine is installed, an EASA Form 1 must be issued for the engine. This requires incorporation of Safran Helicopter Engines Alert Service Bulletin A249 72 0801, Version B (or any subsequent approved issue) for Case 1 engines Safran Helicopter Engines Alert Service Bulletin A249 72 0805, Original Issue (or any subsequent approved issue) for Case 2 engines, and Safran Helicopter Engines Alert Service Bulletin A249 72 0803, Original Issue (or any subsequent approved issue) for Case 3 engines.

3. The uninstalled engine did not undergo the icing tests defined by the applicable certification specifications.

4. All Airworthiness Directives (ADs) issued by DGAC-F related to this product are still applicable unless EASA replaces or cancels them.

SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

n/a

II. Type Certificate Holder Record

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

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	19 April 2011	Initial Issue	Initial Issue, 19 April 2011
Issue 02	01 August 2016	Name change from Turbomeca to Safran Helicopter Engines	01 August 2016

-END-