TYPE-CERTIFICATE

DATA SHEET

No. EASA.P.084

for

R381 series propellers

Type Certificate Holder

GE Aviation Systems Ltd, trading as Dowty Propellers

Cheltenham Road
Bishops Cleeve
CHELTENHAM
Gloucestershire, GL52 8SF
United Kingdom

For Models:

R381/6-123-F/5

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I. General

1. Type / Models

R381/6-123-F/5

2. Type Certificate Holder

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CHELTENHAM
Gloucestershire, GL52 8SF
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Design Organisation Approval No.: EASA.21J.008.

3. Manufacturer

GE Aviation Systems Ltd, trading as Dowty Propellers

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CHELTENHAM
Gloucestershire, GL52 8SF
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4. Date of Application

R381/6-123-F/5
24 July 1990

Note: Application was made to CAA-UK for certification before EASA was established.

5. EASA Type Certification Date

R381/6-123-F/5

Before issue of this EASA Type Certificate Data Sheet, the Type Certification of the R381/6-123-F/5 propellers were covered by CAA-UK Propeller Type Certificate Number 114.

II. EASA Certification Basis

1. Reference Date for determining the applicable airworthiness requirements

12 April 1991

2. EASA Certification Basis

2.1. Airworthiness Standards

JAR-P, Change 7 and special requirements of CAA letter, dated 12 April 1991

2.2. Special Conditions

SC1 – Composite Blades
SC2 – The Failure Analysis
SC3 – Bird Strike
SC4 – Lightning Protection

2.3. Equivalent Safety Findings

None

2.4. Deviations

None

III. Technical Characteristics

1. Type Design Definition

Design Definition	List of Parts	Equipment Set of Drawing
R381/6-123-F/5 (SAAB 2000)	697035001-040 or later approved issues	697031100 Issue 17 or later approved issues

2. Description

The propeller is a variable-pitch, constant speeding, feathering, reversing type, using hydraulic control and counterweights, with 6 blades of composite glass and carbon reinforced plastics construction, polyurethane coated and fitted with nickel leading edge sheath for erosion protection with electric de-icing overshoes. Beta control provides manual pitch selection for aircraft braking and ground manoeuvring. An integrated, full authority engine/propeller electronic control system is provided by the engine manufacturer. The electronic control software meets the “critical” standard of EUROCAE ED-12A / RTCA DO-178A.

3. Equipment

The standard of the associated equipment approved for use with these propeller types is defined by the propeller equipment set drawing 697031100 issue 17 or subsequent approval issue and is published in AMM 1089 and published in Propeller Maintenance Manuals as follows:

Type Definition	R381/6-123-F/5 (SAAB 2000)
PMM Publication	1089

The equipment set comprises the following LRUs:

- Spinner
- Feathering pump
- Overspeed governor
- BETA Tube assembly
- Pitch control Unit
- De-icing equipment
    - Brush block bracket
    - Timer monitor Control Unit
- FADEC software standard, see paragraph 7.2

4. Dimensions

Propeller diameter: 3.8 metres (*150 inches*)

5. Weight

Propeller, complete with spinner: 227 kg (*500 lb*), approximately (*for reference only*)

6. Hub / Blade Combinations

Combinations	**R381/6-123-F/5**
Blade Part No.	697035266-12 , or later
Hub Part No.	697035228 or later

7. Control System

7.1. Pitch Control

Hydraulically actuated blade pitch is controlled by the PCU, which is electronically controlled by the FADEC. The Overspeed Governor (OSG), using flyweights in conjunction with blade counterweights, prevents propeller overspeed.

7.2. FADEC Software Standards (GP21AU15A)

These are the originally certification software standards. The equipment may be used with later approved software standards in accordance with Allison Engine Company documents as follows:

Title,	Report No.	RTCA Document No.
Software Quality Assurance Plan	EDR 15657C	5B
Software Configuration Management	EDR 15625C	5A
Plan for Software Aspects of Certification	EDR 15005	14

8. Adaptation to Engine

Special flange with 15 bolts and 3 dowels, all at 21.59 cm (8.5 inches) P.C.D.

9. Direction of Rotation

Rotation is Right hand tractor (*clockwise when viewed from rear*).

IV. Operating Limitations

Operation of the propeller system outside of the limitations stated below is prohibited unless permitted by revision of the aircraft flight manual.

1. Approved Installations

The R381/6-123-F5 propeller model is intended for use in SAAB 2000 aircraft. The SAAB 2000 is a civil certified twin engine high speed aircraft with a Max Take-Off weight of 22.999 kg (50703 lb). The engine on which the propeller is installed is an Allison AE 2100A turboprop with a Max Take Off Power of 4152 SHP and a Max Take Off Torque of 1471 lbft at 1100 propeller rpm

2. Maximum Take Off Power, Torque and Speed

Max. Take off Power (111%)	3096,1 *(4152)*	kW *(SHP)*
Max Take off Torque (111%)	1995 *(1471)*	Nm *(lbft)*
Max Propeller Speed (100%)	1100 ±1	RPM

3. Maximum Continuous Power, Torque and Speed

Max. Continuous Power (100%)	2787.4 *(3738)*	kW *(SHP)*
Max Continuous Torque (100%)	1802 *(1329)*	Nm *(lbft)*

4. Transients and Overspeed

Maximum propeller overspeed (106%)	1166	RPM
Maximum permitted transient engine torque (130%)	2318 *(1710)*	Nm *(lbft)*

5. Propeller Pitch Angle

The R381 propeller models have variable pitch capability. Pitch control is provided by the governor.

6. Crosswind and Tailwind Restrictions.

6.1. Maintenance Ground Running

All ground running with the aircraft static, wind velocity in excess of 10 kts and power lever above 60° in any mode to be conducted with the aircraft pointed into wind ±45°.

6.2. Flight Operations – Take Off

For Take off with the aircraft static, wind velocity in excess of 15 kts and aircraft not pointed into wind ± 45 degrees, the power lever is not to be advanced above 60° until the brakes have been released.

V. Operating and Service Instructions

Instructions and information on unit Description, Operation, Fault Isolation, Servicing, Removal/Installation, Adjustment Test, Cleaning/Painting and Repairs are covered in the Propeller Maintenance Manual

MANUALS	**R381/6-123-F/5 (SAAB 2000)**	
COMPONENT MAINTENANCE MANUALS	**CMM CHAPTER NUMBERS**	**AMM**
Brush Block Bracket Unit	30-60-01	1089
Timer/Monitor Control Unit	30-60-02	
Propeller	61-10-41	
Spinner	61-10-42	
Feathering pump	61-20-26	
Overspeed Governor	61-20-37	
Beta tubes	61-20-38	
Pitch Control Unit	61-20-39	

VI. Notes

1. The propeller approval does not consider compliance with the aircraft de-icing requirements.
2. Component life limitations are specified in the Approved Airworthiness Limitations Section (ALS) of the Propeller Maintenance Manual.
3. Mandatory Propeller Inspections are specified in the Airworthiness Limitations section of the Propeller Maintenance Manual.
4. The Propeller restoration time and calendar life are specified in the Continued Airworthiness Maintenance Tasks Section of the Propeller Maintenance Manual.
5. The hydraulic fluids for use in the propeller and its control system are specified in the Airworthiness Limitations Section.

VII. SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

ALS	Airworthiness Limitations Section
AMM	Aircraft Maintenance Manual
CMM	Component Maintenance Manual
FADEC	Full Authority Digital Engine Control
OSG	Overspeed Speed Governor
PCU	Propeller Control Unit
PMM	Propeller Maintenance Manual
RPM	Revolutions Per Minute
SHP	Shaft Horse Power

II. Type Certificate Holder Record

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III. Change Record

Issue	Date	Changes	TC issue
01	25 September 2020	Initial Issue, transferred from CAA-UK No. 114 datasheet, including TC-Holder name change	25 September 2020