



## **I. General**

### **1. Type/Variants:**

R408/6-123-F/17, R408/6-123-F/20 (See Note 8)

### **2. Type Certificate Holder:**

Dowty Propellers, Anson Business Park  
Cheltenham Road East, Gloucester  
England, GL2 9QN

Design Organisation Approval No.: EASA.21J.008

### **3. Manufacturer**

Dowty Propellers (a part of GE Aviation System Ltd.)

### **4. EASA Certification Application Date**

R408/6-123-F/17	R408/6-123-F/20
15 November 1995	27 March 2003

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

### **5. EASA Certification Date:**

R408/6-123-F/17	R408/6-123-F/20
16 April 1999	15 May 2006

Before issue of this EASA Type Certificate and Data Sheet, the Type Certification of the R408/6-123-F/17 propeller was covered by CAA-UK Propeller Type Certificate Number 117.

## **II. Certification Basis**

1. JAR-P Change 7 dated 22 October 1987. Orange Paper P/96/1 effective 8 August 1996.
2. Special Conditions :  
SC1 – Composite Blades  
SC2 – The Failure Analysis  
SC3 – Bird Strike  
SC4 – Lightning Protection
3. Deviations: None
4. Equivalent Safety Findings (ESF): None
5. Environmental Requirements: None

### **III. Technical Characteristics**

#### **1. Type Design Definition**

Design Definition	List of Parts	Equipment Set Drawing
R408/6-123-F/17	697070002-010 issue 1 or later approved issues	697075001 issue 28 or later approved issues
R408/6-123-F/20	697115001-000 issue 1 or later approved issues	697110001 issue 1 or later approved issues

#### **2. Description**

The Propeller is a variable pitch, constant speed, feathering, reversing type, using hydraulic control and counterweights, with six composite blades. Beta control provides manual pitch selection for aircraft braking and ground maneuvering. An integrated, full authority, propeller electronic control system, supplied as part of the propeller equipment. The propeller electronic control software meets the Level 'A' (critical) standard of RTCA DO 178B. The R408/6-123-F/17 is approved for operation on the Bombardier Q400 Dash 8 aircraft and the R408/6-123-F/20 is intended for operation on the Shaanxi Aircraft Industry Group Y8F600 aircraft.

#### **3. Equipment**

3.1 The standard of the associated equipment approved for use with these propeller types is defined by the propeller equipment set drawing and published in AMM maintenance manuals as follows:

Type Definition	R408/6-123-F/17	R408/6-123-F/20
AMM Publication	1096	1103
Equipment Set Drawing	697075001	697110001

3.2 The equipment set comprises the following LRUs:

<b>R408/6-123-F/17</b>	<b>R408/6-123-F/20</b>
Propeller Spinner (Aluminum or Composite) Feather Pump Overspeed Governor Beta Tube Assembly Pitch Control Unit Brush Block Bracket Assembly Propeller Electronic Controller Timer Monitor Control Unit	Propeller Spinner (Aluminum) Feathering Pump Overspeed Governor Beta Tube Assembly Pitch Control Unit Brush Block Bracket Assembly Propeller Electronic Controller Timer Monitor Control Unit

3.3 Software Standard: See Section 7.

#### **4. Dimensions**

Diameter: 4.115 meters (162 inches)

## 5. Weights

R408/6-123-F/17	R408/6-123-F/20
Propeller complete with spinner 252 kg (555lbs) approximate (reference only)	Propeller complete with spinner 252 kg (555lbs) approximate (reference only). Dry weight of the propeller system will not exceed 295 kg (650lbs)

## 6. Hub/Blade – Combinations

Combinations	R408/6-123-F/17	R408/6-123-F/20
<b>Blade Part No</b>	697071002 issue 1, or later	697116001 issue 2, or later
<b>Hub Part No</b>	697071230 issue 2, or later	697071266-Y8 issue 2, or later

## 7. Control System

- 7.1 Hydraulically actuated blade pitch is controlled by the Pitch Control Unit (PCU) which is electronically controlled by the Propeller Electronic Controller (PEC). An Overspeed Governor (OSG) utilising flyweights in conjunction with blade counterweights prevents propeller overspeed.
- 7.2 PEC Software Standard : UD1079 (Strike 23)  
TMCU Software Standard : UD1081 (Strike 9)  
These are the original certification software standard. The equipment may be used with later approved PEC software standards controlled in accordance with Dowty Propellers documents as follows:

<u>Title</u>	<b>PEC Report No.</b>	<b>TMCU Report No.</b>	<b>RTCA DO 178B Doc. No.</b>
Software Accomplishment Summary	699008957	699009957	11.20
Software Configuration Index	699008956	699009956	11.15 and 11.16
Plan for Software Aspects of Certification	699008955	699009955	11.1

## 8. Adaptation to Engine

Flange with 15 studs, attachment nuts and 3 dowels.

## 9. Sense of Rotation

Rotation is right hand tractor (clockwise when viewed in the direction of flight).

#### **IV. Operational Limits**

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

##### **1. Propeller Speed**

The following propeller speed information applies to the both R408/6-123-F/17 and /20 propeller variants:

Take-off Propeller Speed (100%)	1020 rpm
Maximum Transient Propeller Overspeed (115%) (115% for a single excursion time of 30 seconds)	1173 rpm

In the case of a propeller control failure, propeller overspeed of 1072 rpm (105%) is allowed for the completion of the flight.

##### **2. Driving Power**

The following driving power information applies to the both R408/6-123-F/17 and /20 propeller variants:

###### 2.1 Torque Limits : Nm (lbf ft)

Take-off Propeller Torque (100%)	35405 (26110)
Maximum continuous Propeller Torque (100%)	35405 (26110)
Maximum Permitted Transient (No restriction on number of occurrences) Propeller Overtorque (108%)	38237 (28199)
Maximum Permitted Transient (Maximum of 300 occurrences, see note 7) Propeller Overtorque (108% - 135%)	47796 (35248)

###### 2.2 Power Limits : kW (SHP)

Take-off Power (100%)	3782 (5071)
Maximum Continuous Power (100%)	3782 (5071)
Maximum Reverse Power	1119 (1500)

##### **3. Propeller Blade Angle**

The following propeller blade angles apply to both the R408/6-123-F/17 and /20 propeller variants and are for blade angles stated at two thirds radius ('station J-J') and 0.7 radius:

	<b>Station J-J</b>	<b>0.7 radius</b>
Feather Angle	86.00° nominal	84.45° nominal (± 0.12° tolerance)
Reverse Angle	-17.75° nominal	-19.30° nominal (± 0.25° tolerance)
Flight Idle Angle (hydraulic 'stop')	17.55° nominal	16.00° nominal

#### 4. Cross-Wind Limitations

The cross-wind ground and flight limitations are stated in the Propeller Operating Limitations, (as declared in PMM publication number 1096 for the R/408-123-F/17 and 1103 for the R408/6-123-F/20), and stated in the applicable Aircraft Flight Manual.

#### 5. General Limitations

- 5.1 Power Lever Angle (PLA) Position : A PLA less than Flight Idle must not be selected at airspeeds greater than 150 knots Equivalent Airspeed (EAS)
- 5.2 Equipment Operation : The propeller is not to be operated with oil temperature below -18°C (0°F).

#### 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 Propeller Maintenance Manual (PMM) (publication number 1096 for the R/408-123-F/17 and 1103 for the R408/6-123-F/20). Assembly / Disassembly are covered in the following Component Maintenance Manuals (CMM):

COMPONENT MAINTENANCE MANUALS	CMM CHAPTER NUMBERS	
	R408/6-123-F/17	R408/6-123-F/20 *
Spinner (Aluminum Alloy)	61-10-47	61-10-62
Spinner (Composite)	61-10-48	Not Applicable
Overspeed Governor	61-20-48	61-20-63
Pitch Control Unit	61-20-47	61-20-62
Beta Tubes	61-20-46	61-10-63
Propeller Unit	61-10-46	61-10-61
Hub Actuator	61-10-49	61-10-65
Blade and Bearing	61-10-50	61-10-64
Brush Block Bracket Unit	30-60-05	30-60-11
Brush Block	Not Applicable	30-60-10
Feathering Pump	61-20-31	61-20-64
Propeller Electronic Controller	61-20-01	61-20-65
Timer Monitor Control Unit	30-60-06	30-60-12

\* Maintenance Manual numbers have been allocated but these manuals are not yet published. These will be published prior to entry into service.

#### 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 Sections of the Maintenance Manual.

3. Mandatory Propeller inspections will be specified in the Airworthiness Limitations Section of the Maintenance Manual.
4. The Propeller restoration time/calendar life will be detailed in Dowty Propellers service bulletin, specified in the Maintenance Manual.
5. The hydraulic fluids for use in the propeller and its control system will be specified in the Airworthiness Limitations Section of the Maintenance Manual.
6. The propeller and its control system will be approved with an overspeed "get-home" capability to cater for propeller control malfunctions. The Propeller Maintenance Manuals 1096 and 1103 operating limits will define the overspeed limit.
7. Transient propeller inadvertent over-torque between 108% and 135% is permitted but is limited to a total number of 300 events in the life of a hub or blade assembly. (Ref: Propeller Maintenance Manual 1096).
8. For the R408/6-123-F/20 variant of the R408 propeller compliance has yet to be demonstrated with JAR-P60 (b), JAR-P160 (b), JAR-P190, JAR-P220.

-----