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# **Type Acceptance Report**

**TAR 96/16 – Revision 1**

**ASI AVIATION F406**



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## Executive Summary

New Zealand Type Acceptance has been granted to the Model F406 based on validation of EASA Type Certificate A.109. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.191, subject to any outstanding New Zealand operational requirements being met. (See Section 5 of this report for a review of compliance of the basic type design with the operating Rules.) Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(c).

NOTE: Information in this report is correct as at the date of issue. The report is only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the applicable State-of-Design Type Certificate Data Sheet.

## 1. Introduction

This report details the basis on which Type Acceptance Certificate No. 96/16 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically the report aims to:

- (a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the model(s) in New Zealand; and
- (b) Identify any special conditions for import applicable to any model(s) covered by the Type Acceptance Certificate; and
- (c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

## 2. State-of-Design Type Certificate Details

Manufacturer: ASI Aviation (spare parts only)  
Reims Aviation Industries (serial no.s 0090 through 0098)  
Reims Aviation (serial no.s 01, 0001 through 0089)

TC Holder: ASI Aviation (since 21/08/2014)

Type Certificate: EASA.A.109  
Issued by: European Aviation Safety Agency

<b>Model:</b>	<b>F406</b>
<b>MCTOW</b>	4246 kg. [9360 lb.] 4468 kg. [9850 lb.] when modified by CESRA 406-0011
<b>Max. No. of Seats:</b>	11 (FAR 23) 14 (SFAR 41C)
<b>Noise Standard:</b>	ICAO Annex 16
<b>Engine:</b>	<b>Pratt &amp; Whitney Canada PT6A-112</b> Type Certificate: E-15 Issued by: Transport Canada
<b>Propeller:</b>	<b>McCauley 3GFR34C701/93KB-0</b> Type Certificate: P60GL Issued by: Federal Aviation Administration

### 3. Type Acceptance Details

The application for type acceptance of the Model F406 “Caravan II” was from Aeromotive Limited by CAA 24021/02 dated 17 October 1996. Serial number 0012 was imported in an accident damaged condition from Kenya for rebuild (ex-5Y-WAW). (An application had previously been received by letter from Reims Aviation dated 9 November 1989 requesting New Zealand certification of the F406 and submitting type data. However no example was imported and type acceptance was not completed.)

Type Acceptance Certificate No. 96/16 was granted on 3 July 1997 to the F406, initially based on validation of DGAC Type Certificate 175. This has now been superseded by EASA Type Certificate A.109. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import.

The F406 was a joint development between Reims and Cessna. It utilises parts of the (unpressurised) Titan fuselage mated to a Conquest I nose and Conquest II tail, but with a dihedralled cruiform tailplane/fin configuration similar to the Citation I. Conquest II wings are used with a redesigned nacelle to fit a PT6A-112 engine flat-rated to 500 shp.

This report was raised to Revision 1 under CAA Work Request number 16/21B/9 to record the change in Type Certificate holder and the issue of an EASA type certificate to replace the DGAC one. The opportunity was also taken to update the report to the latest format.

## 4. NZCAR §21.43 Data Requirements

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents, or were already held by the CAA:

(1) ICAO Type certificate:

EASA Type Certificate Data Sheet number A.109 at Issue 04 dated 7 January 2015  
– Model F406 approved 21 December 1984

Supersedes:

French DGAC Certificat de Navigabilite de Type Numero 175 – Reims Cessna  
F406 dated 21 Dec 1984

DGAC Type Certificate Data Sheet No.175 at Edition 5 dated 5 May 1988

Certificat de Type de Limitation de Nuisances N.175 F 406 dated 30 April 1985

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the F406 is FAR Part 23 including Amendments 23-1 through 23-13, plus Subpart B and some additional paragraphs at Amendment 23-14, plus some further paragraphs at still later Amendments up to 23-26; SFAR 27 including Amendments 27-1 through 27-4; SFAR 41C and Exemption No. 4661. (See the TCDS for full details.) This is an acceptable certification basis in accordance with CAR Part 21B Para 21.41, as FAR Part 23 is the basic standard for Normal and Commuter Category Airplanes called up under Appendix C. There are no non-compliances and no special conditions have been prescribed by the Director under CAR 21.23.

(ii) *Special Conditions:*

(a) In addition to the requirements of 23.677, it must be demonstrated that, at critical weights and C of G positions, the airplane is safety controllable and a pilot can perform all the manoeuvres and operations necessary to effect a safe landing following any probable electric trim tab runaway which might be reasonably expected in service allowing for appropriate time delay after pilot recognition.

(b) In addition to the requirements of 23.629, it must be shown by analysis or test, or a combination of both, that the airplane is free from flutter, control reversal, and divergence up to  $V_D / M_D$  after the failure, malfunction, or disconnection of any single element in the elevator tabs control system.

(iii) *Exemptions:*

FAA Exemption No.4661 – FAR §23.207(c) - Requires the stall warning to begin at a speed at least 5 kt above  $V_s$  but not more than 10 kt or 15% above  $V_s$ . This is not possible with a high power-to-weight aircraft like the F406. The exemption permitted compliance to be shown at the wings-level power off  $V_s$  at forward c.g. and MTOW, plus evaluation of further specific conditions.

(iv) *Equivalent Level of Safety Findings:*

FAR 23.1189 (a) Shutoff Means – A firewall shutoff valve was not required provided equivalent safety was achieved by having hydraulic system components on the engine side of the firewall being fireproof and flexible hose assemblies must meet specified fire resistance criteria.

(v) *Airworthiness Limitations:*

See Maintenance Manual Chapter 4 – Airworthiness Limitations

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The Model F406 has been certificated for noise in accordance to ICAO Annex 16, Volume 1, Chapter 6.

(ii) *Compliance Listing:*

Approved Noise Level : 72.0 dB(A) – See TCDS Note 1.

(4) Certification Compliance Listing:

The following documents were originally supplied in 1986:

Cessna Report No. 406-82-066 – Master Compliance Check List – dated 11-9-1984

Cessna Report No. 406-84-017 – Electrical Load Analysis – CAA

Cessna Report No. S-406-110 – Model 406 Structures Data Summary

DM406-0 Delegation Option Manufacture Flight Test Report Model 406 (FAR 23)

DM406-1 Delegation Option Manufacture Flight Test Rpt. Model 406 (SFAR 41)

Report No.508 D’Etude - DGAC Mesures de Bruit Avions F 406 [Reims Aviation]  
Suivant L’Annexe 16 de l’OACI dated Avril 1985

(5) Flight Manual: F406 EASA Approved Pilot’s Operating Handbook  
Publication D1624-E2R11-13PH – CAA Accepted as AIR 2582

(6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

F406 Maintenance Manual – Publication D2536R5-13

F406 Wiring Diagram Manual – Publication D2537-3-13

(ii) *Current service Information:*

Service Bulletins and Service Information Letters

(iii) *Illustrated Parts Catalogue:*

F406 IPC – Publication P673-14-12

Note: Reims letter Ref: DM 97905 dated 3 Feb 1997 confirms that Cessna manuals are applicable to the Reims-manufactured Model F406. (Cessna Report No.DM406-0 on FAA Exemption 4661 states “Through a long and involved process of negotiations, the Model F406 is constructed by Reims Aviation in France to type design data developed by Cessna in the United States. Key to this process is utilization of identical type design data for both the Models 406 and F406 airplanes.”)

(7) Agreement from manufacturer to supply updates of data in (5), and (6):

CAA 2171 from ASI-Aviation Head of Airworthiness Deputy dated 26-08-2015

Publications are available on the website: <http://documentation.asi-aviation.fr/>



## 5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 has been assessed as they are a prerequisite for the grant of an airworthiness certificate.

### Civil Aviation Rules Part 26

#### Subpart B – Additional Airworthiness Requirements

##### Appendix B – All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	<i>To be determined on an individual aircraft basis</i>
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

##### Appendix C – Air Transport Aeroplanes – More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	Complies – See Fax from Reims dated 26 June 1997
C.2.1	Additional Emergency Exits – FAR 23.807(b) @ 10.5.93	The F406 has exits on both sides of the fuselage.
C.2.2	Emergency Exit Evacuation Equipment – Descent means	N/A – Overwing exit less than 2m from the ground
C.2.3	Emergency Exit Interior Marking – Size/self-illuminating	Complies – See Fax from Reims dated 26 June 1997
C.3.1	Landing Gear Aural Warning – Automatic Flap Linking	Fitted as Standard – See Flight Manual Page 7-25

Compliance with the following additional NZ operating requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, except as noted:

### Civil Aviation Rules Part 91

#### Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Seating and Restraints – Safety belt/Shoulder Harness	5-point Restraint system fitted as standard – See AFM 7-30
91.507	Pax Information Signs – Smoking, safety belts fastened	N/A – No separation between crew and pax compartments
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	FAR §23.1303(a) N/A – No mach limitations FAR §23.1303(b) FAR §23.1303(c) FAR §23.1305(a) FAR §23.1305(e) FAR §23.1305(b)
91.511 Night	(1) Turn and Slip (2) Position Lights	Fitted as std – See AFM/POH FAR §23.1385
91.513	VFR Communication Equipment	<i>Operating Rule – Compliance to be determined by Operator</i>
91.517	IFR Instruments and Equipment	<i>Operating Rule – Compliance to be determined by Operator</i>
91.519	IFR Communication and Navigation Equipment	<i>Operating Rule – Compliance to be determined by Operator</i>
91.523	Emergency Equipment: (a) More Than 9 pax – First Aid Kits per Table 7 – Fire Extinguishers per Table 8 (b) More than 20 pax – Axe readily accessible to crew (c) More than 61 pax – Portable Megaphones per Table 9	<i>Operating Rule – Compliance to be determined</i> <i>Operating Rule – Compliance to be determined</i> Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats
91.529	ELT - TSO C126 406 MHz after 22/11/2007	<i>To be determined on an individual aircraft basis</i>
91.531	Oxygen Indicators – Volume/Pressure/Delivery	<i>Operating Rule – Compliance to be determined by Operator</i>
91.533	Supplemental Oxygen for non-Pressurised Aircraft >30 min above FL100 – Supplemental for crew, 10% Pax – Therapeutic for 3% of Pax Above FL100 – Supplemental for all Crew, Pax – Therapeutic for 1% of Pax – 120 litre PBE for each crew member	Maximum Operating Altitude Limit in Flight Manual (with oxygen equipment) is 30,000 ft <i>Operating Rule – Compliance to be determined as applicable</i>
	[ An optional oxygen system is a 114.9 cu.ft. bottle in the nose compartment. The plumbed outlets for the pilot and copilot are located inside the stowage compartment under the outboard armrests, while outlets for passengers are located overhead of each seat position. The oxygen control, and pressure gage are located on the instrument panel. ]	
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operating Rule – Compliance to be determined by Operator</i>
91.543	Altitude Alerting Device - Turbojet or Turbofan	Not Applicable – Not turbo jet or turbofan powered
91.545	Assigned Altitude Indicator	<i>Operating Rule – Compliance to be determined by Operator</i>
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

## Civil Aviation Rules Part 135

### Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
135.355	Seating and Restraints – Shoulder harness flight-crew seats	FAR §23.785
135.357	Additional Instruments (Powerplant and Propeller)	FAR §23.1305
135.359	Night Flight	<b>Operating Rule – Compliance to be determined by Operator</b>
	Landing light, Pax compartment	
135.361	IFR Operations	<b>Operating Rule – Compliance to be determined by Operator</b>
	Speed, Alt, spare bulbs/fuses	
135.363	Emergency Equipment (Part 91.523 (a) and (b))	<b>To be determined on an individual aircraft basis</b>
135.367	Cockpit Voice Recorder	N/A – Only for 2-crew helicopters with more than 10 pax
135.369	Flight Data Recorder	Not Applicable – Part 135 requires less than 10 pax seats
135.371	Additional Attitude Indicator	Not Applicable – Not turbo jet or turbofan powered

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was exactly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/119 operating requirements should be checked in each case, particularly oxygen system capacity and emergency equipment.

## Attachments

The following documents form attachments to this report:

- Photographs First-of-Type example s/n F406-0012 ZK-CII
- Three-view drawing Reims Cessna Model F406
- Copy of EASA Type Certificate Data Sheet Number A.109

## Sign off

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 David Gill  
 Team Leader Airworthiness

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 Checked – Peter Gill  
 Team Leader Design

## Appendix 1

### List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
F406	Aeromotive Limited	97/21B/8	3 July 1997