
Type Acceptance Report

TAR 99/16 – Revision 1

Fokker F27 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Fokker F27 Series based on validation of EASA Type Certificate number A.036. 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: The information in this report was correct as at the date of issue. The report is generally 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 latest revision of the State-of-Design Type Certificate Data Sheet referenced herein.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 99/16 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.

The report also notes the status of all models included under the foreign type certificate which have been granted type acceptance in New Zealand. Models covered by the type acceptance certificate issued under Part 21B are listed in Section 2 of this report. Models which were certificated prior to that under NZCAR Section B.9 and are type accepted under the transitional arrangements of Part 21 Appendix A(c) are listed in Appendix 1.

2. Aircraft Certification Details

(a) State-of-Design Type and Production Certificates:

Manufacturer: Royal Netherlands Aircraft Factories Fokker
Fokker-VFW N.V.
Fokker B.V.

Type Certificate Holder: Fokker Services B.V.

Type Certificate: A.036
Issued by: European Aviation Safety Agency

(b) Models Covered by the Part 21B Type Acceptance Certificate:

- (i) **Model:** F27 Mark 500
- MCTOW: 43,000 lb [19,730 kg]
45,000 lb [20,410 kg] when modified per SB 53-89
45,900 lb [20,820 kg] when modified per SB 51-28 or 51-35
- Max. No. of Seats: 59
- Noise Standard: FAR Part 36 (Chapter 2) and ICAO Annex 16
- Engine:** Rolls Royce Dart 532/535/536/551/552 Series
(See TCDS for Eligible Alternate Engine Installations and the associated approved Fokker Service Bulletin)
- Type Certificate: E.065
Issued by: European Aviation Safety Agency
- Propeller:** Dowty Rotol (c) R193/4-30-4/ Series (see TCDS)
- Type Certificate: n/a
Issued by: UK Civil Aviation Authority
- (ii) **Model:** F27 Mark 050
- MCTOW: 45,900 lb [20,820 kg]
- Max. No. of Seats: 62
- Noise Standard: ICAO Annex 16 (Chapter 3)
- Engine:** PW125B or PW127B
- Type Certificate: E-19
Issued by: Transport Canada

Propeller: Dowty Roto1 (c) R352/6-123-F/1 or 2
Type Certificate: 105
Issued by: UK Civil Aviation Authority

Dowty Roto1 (c) R410/6-123-F/35 or 36
Type Certificate: 110
Issued by: UK Civil Aviation Authority

NOTE: See Advisory Circular AC21-1 Appendix 2 for the New Zealand type acceptance status of engines and propellers listed above.

3. Application Details and Background Information

The application for New Zealand type acceptance of the F27 Mark 500 was from Airwork (NZ) Ltd dated 16 September 1998. The First-of-Type example was serial number 10680 registered as ZK-POH. This was the third Mark 500 in the Air Post fleet, but is a later production aircraft (manufactured 1985) and variant (Version 5333) not covered by the existing type acceptance certificate. The Fokker F27 Series is a pressurised twin-turboprop high-wing Transport Category airliner with provision for up to 62 passengers.

Type Acceptance Certificate No.99/16 was granted on 4 November 1998 to the Fokker F27 Mark 500 Version 5333 based on validation of RLD Type Certificate A22F. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The F27 Friendship was an all-new design which first flew in 1955 and was in production in various guises until 1997. The initial version was the Mk.100, which was first operated in New Zealand by National Airways Corporation, starting with ZK-BXA in May 1960. The F27 Mk.200 had more powerful engines, and was operated in NZ by the Calibration Flight of the Ministry of Transport, starting with ZK-DCA in March 1971. The Mk.500 is the same as a Mk.200 or a Mk.600 (large freight door) except for a stretched fuselage. The Mk.500 version was also operated by NAC starting with ZK-NFA in March 1977. A single freighter Mk.600 was operated by Ansett NZ from November 1990 as ZK-RTA.

This report was raised to Revision 1 to include the F27 Mark 050 after application from Alliance Airlines (NZ) Ltd received 24 March 2017. The First-of-Type example was serial number 20160 to be registered ZK-ALL. Type acceptance was granted on 15 August 2017.

The F27 Mark 050 “Fokker 50” is an extensively developed version of the F27 Mark 500 with new Pratt & Whitney Canada PW125B engines, six-blade composite propellers, new aircraft systems and EFIS cockpit instrumentation, and increased use of composite structure with double the number of smaller passenger windows. The Mark 050 was originally approved by RLD under a new type certificate number T-050-87, and succeeded the Friendship in production in 1987.

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) State-of-Design Type certificate:

EASA Type Certificate Number A.036

EASA Type Certificate Data Sheet number A.036 at Issue 06 dated 15 July 2016

- Fokker F27 Mark 100 Approved October 29, 1957
- Fokker F27 Marks 200, 500, 600 Approved May 25, 1965
- Fokker F27 Mark 050 Approved May 15, 1987

Supersedes:

- RLD Type Certificate A22F re-issued to Fokker Services June 5, 1996
- Type Certificate Data Sheet No. A22F – Issue 12 dated June 5/96

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Fokker F27 Friendship Marks 100 through 700 is U.S. CAR Part 4b effective December 31, 1953, including Amendments 4b-1 and Items of Amendments 4b-2 through 4b-8, as noted on the TCDS; SR-422B effective July 9, 1959, Sections 4T.110 through 4T.123 and 4T.743; and the Special Conditions contained in the Annex to letter from RLD no. LI/13880 dated August 6, 1958. Additional compliance with SR-450A and various sections of FAR Part 25 were shown when the aircraft is modified in accordance with Fokker Service Bulletins, also as referenced on the TCDS.

For the F27 Mark 050 the certification basis was updated to JAR 25, as amended by Change 9 dated November 30, 1982, except for some paragraphs where compliance was shown to FAR Part 25 at the Amendment level specified on the TCDS, and some paragraphs of JAR 25 at a later Change status, as referenced on the TCDS. Two exemptions were granted and a Special Condition applied for lightning strike protection indirect effects. These were reviewed and accepted by the CAA.

These are both an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, because CAR 4b is the predecessor to FAR Part 25, and JAR 25 is equivalent to FAR Part 25, which is the basic standard for Transport Category Airplanes called up under Appendix C. There are no non-compliances and no special conditions have been prescribed by the Director under §21.23.

(ii) *Special Conditions:*

Fokker F27 Marks 100-700:

Annex to letter from RLD no.LI/13880 dated August 6, 1958 – This contains a series of additional provisions related to the turbine engines, fuel system, icing protection and other changes.

Fokker F27 Mark 050:

JAR 25.1309(a), (c), (d), (g): Lightning Strike Protection-indirect effects – Added requirements that design and installation of systems critical to flight must be such that they are not affected and essential systems must still perform their intended function after exposure to lightning.

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Exemptions:*

Fokker F27 Mark 050:

JAR 25.1149: Propeller Speed and Pitch Controls – The Fokker 50 does not have separate propeller speed controls but instead uses an electronic system which selects propeller speed on both engines simultaneously using engine rating buttons. This was because the system is more reliable, has overtorque protection, reduces workload, and there is no operational need for speed differential.

JAR 25.1305(e): Propeller Reverse Pitch Indication – No reverse pitch indication was required because the NPRM showed the requirement was only intended for reciprocating engines.

(v) *Airworthiness Limitations:*

Airworthiness Limitations Section ALS and Structural Inspection Program

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The F27 Marks 200 through 600 have been certificated for noise under ICAO Annex 16 and FAR Part 36, at Amendments 36-1 Stage 2, or at Amendment 36-7 Stage 3 for late production aircraft, or Amendment 36-12, Stage 3 for aircraft when modified per SB F27/71-28 (Air intake acoustical liners [hush kit]). See TCDS.

The F27 Mark 050 has been certificated for noise under ICAO Annex 16, Volume 1, First Edition 1981 Chapter 3 including Amendment 2.

(ii) *Compliance Listing:*

EASA TCDS for Noise EASA.A.036 – Issue 03, 20 July 2010

(4) Certification Compliance Listing:

Since the Fokker F27 has been operated extensively in NZ the CAA already had a full range of type data and operation/maintenance documentation, including:

Fokker Report Nr. G.o-27.1 – Load Cases of the F.27 “Friendship”

Report LU-27-58 – Airworthiness Requirements applicable to the F.27 “Friendship”

Report Lu-27-72 – Type Record (Concept) for NZ National Airways Corporation

F50 Aircraft Compliance Checklist P003

(5) Flight Manual: F.27 Airplane Flight Manual RLD Approved – Version(s) 5333

Operator: Airwork (NZ) – Aircr.S/N: 10680

CAA Accepted as AIR 2639

EASA-Approved Fokker F-27 Airplane Flight Manual Mark 050

Operator: Alliance Airlines – A/C SN: 20160

CAA Accepted as AIR 3379

(6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Fokker 50/60 Aircraft Maintenance Manual AMM

Fokker 50/60 Wiring Manual WM

Fokker 50 Structural Repair Manual SRM

Fokker 50/60 Maintenance Review Board Report MRBR

Fokker 50/60 Maintenance Planning Document MPD

(ii) *Current service Information:*

Service Bulletins, Service Letters

(iii) *Illustrated Parts Catalogue:*

Fokker 50/60 Illustrated Parts Catalog IPC

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

Fokker Services provides CAA documentation access at www.myfokkerfleet.com

(8) Other information:

Fokker 50 Aircraft Operating Manual AOM

Fokker 50 Type Specification – Document CB-505001 Second Issue Apr 15/85

5. New Zealand Operational Rule Compliance

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 has been assessed for the Fokker F-27 Friendship Marks 100 through 600, and F27 Mark 050 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 – Agricultural Aircraft	CAM 8 Appendix B Section .35 – Not Applicable

Appendix C – Air Transport Aircraft – More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	CAR 4b354(b) and (e); CAR 4b.362(g)/ JAR §25.0809(b) and (d)
C.2.1	Additional Emergency Exits – More than 23 Passengers	Meets CAR 4b/JAR 25 Certification requirements
C.2.2	Emergency Exit Evacuation Equipment – Descent means	N/A – Exits less than 2m from ground
C.2.3	Emergency Exit Interior Marking – Size/self-illuminating	Complies by inspection – See Compliance Checklist/JAR §25.0811(e) and JAR §25.0812(b) *
C.3.1	Landing Gear Aural Warning – Automatic Flap Linking	CAR 4b.334€(2)/JAR §25.0729(e)

Appendix D – Air Transport Aircraft – More than 19 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
D.1.1	Exit Types – Shall be per FAR 25.807 @ 29.03.93	CAR 4b.362(b) has equivalent provisions/JAR §25.0807
D.1.2	Floor Level Exits – Definition	Meets CAR 4b Certification requirements/JAR §25.0807(a)
D.2.1	Additional Emergency Exits – Must meet requirements	Meets CAR 4b Certification – No ventral or tailcone exits
D.2.2	Emergency Exit Access – unobstructed access; Crew assist space; Internal doors can be latched open – placarded	N/A – All cargo configuration JAR §25.0813(a) through (f) *
D.2.3	Emergency Exit Operating Handles – Markings/Lighting	Complies by inspection – See Airwork Compliance Checklist JAR §25.0811(e) *
D.2.4	Emergency Exit Evacuation Equipment – Descent means	N/A – Exits less than 6 feet from the ground
D.2.5	Emergency Exit Escape Route – Must be slip resistant	N/A – No applicable escape routes
D.2.6	Emergency Lighting (a) Switch Provisions; Uninterrupted Power; Last 10 min. (b) Descent Illumination – Automatic and Independent	Complies by inspection – See Airwork Compliance Checklist JAR §25.0812(e) * JAR §25.0812(g) *
D.2.7	Emergency Interior Lighting – independent supply; min. illumination; incl. floor proximity escape path markings	N/A – All-cargo configuration JAR §25.0812(e) and JAR §25.0811(e) *
D.2.8	Emergency Exterior Lighting – In effect 30.04.72 or later	Complies by inspection – See Airwork Compliance Checklist JAR §25.0812
D.2.9	Emergency Exit Interior Marking – independent supply; minimum illumination;	Complies by inspection – See Airwork Compliance Checklist JAR §25.0811(b), (d) and JAR §25.0812(b)(1)(i) *
D.2.10	Emergency Exit Exterior Markings – 2” contrasting band; opening instructions in red or bright chrome yellow;	Complies by inspection – See Airwork Compliance Checklist JAR §25.0811(f) *
D.3	Lavatory Fire Protection – Placards; ashtray; Waste Bin	N/A – No lavatory fitted AD DCA/GEN/7A (FAA AD 74-08-09R2); DCA/GEN/16 JAR §25.0791(d) and JAR §25.0853(d), (e) *
D.4	Materials for Compartment Interiors – (b) Aircraft Type Certificated after 1 January 1958 € Seat cushions (except flightdeck) must be fireblocked	N/A – F.27 type certificated before 1 January 1958 N/A – All-cargo configuration DCA/GEN/15 [FAR 25 §25.853(e) Amdt 59 Eff 26/11/84]; DCA/GEN/21 [FAR §121.312(a) Amdt 121-198 Eff 26/9/88] *
D.5	Cargo and Baggage Compartments – T/C after 1.01.58: (a) Each C or D compartment greater than 200 cu ft shall have liners of GFRS or meet FAR 25 in effect 29.03.93 € Liners shall be separate from the aircraft structure	N/A – Class E Cargo Compartment N/A – Class E Cargo Compartment DCA/GEN/22 [FAR Part 25.855 Amdt 25-32 Eff May 1, 1972 and Part §121.314 Amdt 121-202 Eff Mar 20, 1989] *
		* NOTE: Compliance may depend on actual amendment date of JAR 25 paragraph, and/or compliance with GEN Airworthiness Directive. Compliance to be checked on an individual aircraft basis.

Civil Aviation Rules Part 91

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	Inertial reel harness standard per F-27 Type design
91.507	Pax Information Signs – Smoking, safety belts fastened	N/A – All cargo configuration/JAR §25.0791
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	CAR 4b.612(a)/JAR §25.1303(b)(1) CAR 4b.603(j) – N/A CAR 4b.612(b)/JAR §25.1303(b)(2) CAR 4b.612/JAR §25.1303(a)(3) CAR 4b.613(b)/JAR §25.1305(a)(2) CAR 4b.612/JAR §25.1305(e)(3) CAR 4b.612/JAR §25.1305(a)(4)
91511 Night	(1) Turn and Slip (2) Position Lights	(8) Coolant Temp N/A – Turbine engine (9) Oil Temperature CAR 4b.604(m)/JAR §25.1305(a)(6) (10) Manifold Pressure N/A – Turbine engine (11) Cylinder Head Temp. N/A – Turbine engine (12) Flap Position CAR 4b.323€/JAR §25.0699 (13) U/C Position CAR 4b.334€/JAR §25.0729(e) (14) Ammeter/Voltmeter CAR 4b.622(d)/JAR §25.1351(b)(6)
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	CAR 4b.603(f)/JAR §25.1303 CAR 4b.632/JAR §25.1389 CAR 4b.603(g)/JAR §25.1303(b)(5) CAR 4b.603(h)/JAR §25.1303(b)(6) CAR 4b.612€/JAR §25.1331(a) CAR 4b.612(b)/JAR §25.1303(b)(2)
91.523	(a) More Than 10 pax – First Aid Kits per Table 7 – Fire Extinguishers per Table 8 (b) More than 20 pax – Axe readily acceptable to crew € More than 61 pax – Portable Megaphones per Table 9	(3) Anti-collision Lights CAR 4b.637/JAR §25.1401 (4) Instrument Lighting CAR 4b.630/JAR §25.1381 (5) OAT CAR 4b.603(d)/JAR §25.1303(a)(1) (6) Time in hr/min/sec CAR 4b.603€/JAR §25.1303(a)(2) (7) ASI/Heated Pitot CAR 4b.603€/JAR §25.1323(e) (8) Rate of Climb/Descent CAR 4b.603€/JAR §25.1303(b)(3)
91.529	ELT – TSO C91a after ¼/97 (or replacement)	Installed in accordance with Air NZ TB 2520-02267 Operating Requirement – Compliance to be determined N/A – All-cargo configuration N/A – All-cargo configuration
91.531	Oxygen Indicators – Volume/Pressure/Delivery	To be determined on an individual aircraft basis CAR 4b.651/JAR §25.1441 through §25.1450 Complies – see Airwork Compliance Checklist
91.535 Press. A/c	(1) Flight Crew Member On-Demand Mask; 15 min PBE (2) 1 Set of Portable 15 min PBE (3) Crew Member – Pax Oxygen Mask; Portable PBE 120l (4) Spare Oxygen Masks/PBE (5) Min Quantity Supplement Oxygen (6) Required Supplemental/Therapeutic Oxygen Above FL250 – Quick-Donning Crew On-Demand Mask Above FL300 – Total Outlets Exceed Pax by 10%	TSO C89 and C99 Equipment fitted – See Airwork Compliance Checklist/ * Compliance to be determined Spare mask to TSO C64 fitted/ * Complies – See Airwork Compliance Checklist/ * Complies – 1074 lt. Capacity main oxygen bottle Complies – See Airwork Compliance Checklist/ * N/A – Maximum altitude is FL250 – See AFM Section 2 N/A – Maximum altitude is FL250 – See AFM Section 2
91.543	Altitude Alerting Device – Turbojet or Turbofan	N/R – see below
91.545	Assigned Altitude Indicator	Complies by inspection – See Airwork Compliance Checklist/ *
A.15	ELT Installation Requirements	To be determined on an individual aircraft basis

Civil Aviation Rules Part 121

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
121.355	Additional Instruments (Powerplant and Propeller)	CAR 4b.613(e)/JAR 25 is equivalent to Appendix C standard
121.357	Additional Eqpt – Windscreen Wiper, Door, Key, Placard	Operational requirement – To be determined by Operator
121.359	Night Flight	Landing Light, In Pax cabin
121.361	IFR Operations	Speed, Alt, spare bulbs/fuses Dual heated pitot, ASI/Alt. Operational requirement – To be determined by Operator
121.363	Flights over water	Liferafts Operational requirement – To be determined by Operator
121.365	Emergency Equipment	Per §91.523 and EROPS kit Operational requirement – To be determined by Operator
121.367	Protective Breathing Equipment	TSO C99 Equipment fitted – See Airwork Compliance Checklist/ *
121.369	Passenger Address and Crew Intercom system	Intercom system found embodied – PA N/A to cargo configuration/ *
121.371	Cockpit Voice Recorder	TSO C84 Equipment fitted – See Airwork Compliance Checklist/ *
121.373	Flight Data Recorder	TSO C51 Equipment fitted – See Airwork Compliance Checklist/ *
121.375	Additional Attitude Indicator	Complies by inspection – See Airwork Compliance Checklist/ *
121.377	Weather Radar	TSO C63b Equipment fitted – See Airwork Compliance Checklist/ *
121.379	Ground Proximity Warning System	TSO C92b Equipment fitted – See Airwork Compliance Checklist/ *
		* Compliance to be determined in an individual aircraft basis for the Fokker 50

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was directly 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 of First-of-Type example F.27-500 s/n 10860 ZK-POH
Three-view drawing Fokker F-27 Mark 500 Friendship
Three-view drawing Fokker F-27 Mark 050
Copy of EASA Type Certificate Data Sheet A.036

Sign off

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David Gill
Team Leader Airworthiness

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Checked – Kavita van Mari
Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
F27 Mark 100	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
F27 Mark 200	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
F27 Mark 500	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
F27 Mark 600	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
F27 Mk.500 Version 5333	Airwork Holdings Limited	99/21B/16	4 November 1998
F27 Mark 050	Alliance Airlines (NZ) LTD	17/21B/19	15 August 2017