
Type Acceptance Report

TAR 1/21B/2 – Revision 4

Boeing 737-800 Series

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Executive Summary

NZ Type Acceptance has been granted to the Boeing 737-800 Series based on validation of FAA Type Certificate number A16WE. 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.1/21B/2 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 State-of-Design 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.

2. Aircraft Certification Details

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

Manufacturer: The Boeing Company
Type Certificate: A16WE
Issued by: Federal Aviation Administration
Production Approval: FAA PC700

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

(i) **Model:** 737-800
MCTOW: 174,200 lb. (78,824 kg.) – Structural Design Weight
Max. No. of Seats: 189
Noise Standard: FAR Part 36, including Amendments through 36-20 (Stage 3)
Engine: CFM56-7B Series *
Type Certificate: E000055EN
Issued by: Federal Aviation Administration
Type Certificate: E.004
Issued by: European Aviation Safety Agency

* The actual engine designation depends on the thrust rating selected.

3. Application Details and Background Information

The original application for type acceptance of the Model 737-8Q8 was from Polynesian Airlines dated 4 July 2000. The first-of-type example was serial number 30039, Airplane Tabulation number YC146, registered 5W-SAM. The 737-600/700/800 Series are the “NG” (New Generation) versions of the 737 first introduced in 1997, which incorporated extensive changes including an all-new wing, undercarriage, cockpit and engine variant. The 737-800 can be configured for up to 186 passengers at 30 inch seat pitch. (Polynesian Airlines layout is 12 business and 142 economy class seats. [Ref: LOPA-378-0850])

Type Acceptance Certificate No. 1/21B/2 was granted on 14 November 2000 to the Boeing 737-800 based on validation of FAA Type Certificate number A16WE, and included the CFM56-7B Series engine based on FAA Type Certificate no. E00055EN or EASA Type Certificate number E.004. Specific applicability is limited to the coverage provided by the operating data supplied. There are no special requirements for import into New Zealand.

This report was raised to Revision 1 under CAA Work Request 4/21B/9 to include another variant and update the report to the latest format. The applicant was Pacific Blue Airlines for the 737-8FE, which was type accepted on 13 January 2004. The first-of-type example was s/n 33796, Line No.1377, Tab No. YJ865, registered ZK-PBA. -8FE is the customer identification model designation for Virgin Blue Airlines (VB), who have a policy of using a single standard specification for their fleet. This configuration is also used by Pacific Blue Airlines. The standard VB layout is 180 tourist class seats. [Ref: LOPA 378-1264]

Revision 2 of the report was produced to include type acceptance of the 737-8BK variant, also for Pacific Blue Airlines, which was granted on 26 February 2004. The first-of-type example was Serial Number 33017, Line Number 1446, Tab Number YJ932, registered ZK-PBC. -8BK is the Boeing customer designation for leasing company CIT Aerospace. In the specification the aircraft was originally configured for 189 passengers and certified at a maximum takeoff weight of 155,500 lb.

This report was raised to Revision 3 to add the 737-838 variant under CAA Work Request 9/21B/15. The applicant was Jetconnect Limited, and type acceptance was granted on 16 September 2009. 838 is the customer designation for QANTAS, who have a large on-going order for the type. Jetconnect initially added three new aircraft to their fleet, serial numbers 34200 through 34202, Variable YL556-558, registered ZK-ZQA through ZK-ZQC. These aircraft have a 12J/156Y cabin layout [Ref: LOPA-378-2101] and incorporate a number of new technical features: Rockwell Collins HGS4000 Head-Up Display (fitted under STC ST00845SE); Short Field Performance Package (comprising two-position tailskid, winglet lift credit, increased spoiler deflection on the ground, sealed slats and reduced idle thrust delay after touchdown); centre fuel tank Nitrogen Inerting System; new 16g HIC compliant seats with front-row inflatable seatbelts (subsequently removed); and a Panasonic on-demand IFE system. The 737-838 is fitted with the CFM56-7B26/3 Tech Insertion engine. This introduced improvements to the high-pressure compressor, the combustor, and the high- and low-pressure turbines to achieve better fuel consumption and lower emissions.

Revision 4 of the report was issued to include the 737-8SH variant. The application from Air Vanuatu was forwarded through the Pacific Aviation Safety Organisation. -8SH is the customer designation for Air Lease Corporation. The first-of-type example was serial

number 42052, which is operated by Air Vanuatu as YJ-AV8. The aircraft is configured with eight first class seats and 162 economy class seats. The opportunity was also taken to separate out the engine validation, which is now covered by Type Acceptance Certificate number 19/21B/9. Type acceptance of the 737-8SH was granted on 24 August 2018.

NOTES: Because Boeing provides CAA access to the myboeingfleet.com website for all serial numbers on the NZ Register, this revision has also been used to record that CAANZ now accepts all variants of the Boeing 737-800 Series that have been approved against the certification basis stated on the FAA TCDS and referenced in this report in Section 4.2, subject to provision of access to the applicable operating documentation.

Boeing only provides access on myboeingfleet.com to any serial number aircraft that are on the New Zealand Civil Aircraft Register. Therefore copies of any applicable operating and maintenance documentation must be provided by Boeing or the aircraft operator until the aircraft is registered.

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:

FAA Type Certificate Number A16WE
FAA Type Certificate Data Sheet no. A16WE at Revision 62 dated May 18, 2018
– Model 737-800 approved March 13, 1998

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Boeing 737-800 is FAR Part 25 effective February 1, 1965, as revised by Amendments 25-1 through 25-77 (FR 28949, June 29, 1992), with the exception of an earlier amendment status for certain paragraphs as specified on the FAA TCDS, plus the addition of a later amendment status for some paragraphs also as listed on the TCDS. Two special conditions were imposed, three exemptions were requested and a large number of equivalent safety findings made, again as detailed on the TCDS. This is an acceptable certification basis in accordance with NZCAR Part 21B paragraph §21.41, as FAR Part 25 is the basic standard for Transport Category Airplanes called up under Appendix C. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) *Exemptions:*

Exemption No. 6086 – from §25.1435(b)(1) Hydraulic Systems – Testing to the system relief pressure of 3400 psi was accepted in lieu of full 1.5 times operating pressure. Compliance was shown by a combination of range-of-motion tests of the complete system (to show adequate separation under structural load) and component testing to the ultimate pressure of 4500 psi, on the basis this was just as effective a means to show system integrity.

Exemption No.6425 – from §25.562 Emergency Landing Dynamic Conditions – The flight deck seats were exempted from the floor warpage testing requirement of §25.562(b)(2), which requires the seat tracks to be misaligned 10 degrees and rolled 10 degrees, on the basis of satisfactory service history. (Flight deck seats are usually mounted individually and rigidly.)

Exemption No.6601 – from §25.571(e)(1) Damage-Tolerance & Fatigue Evaluation of Structure – The airplane must be capable of completing a flight after structural damage after a four-pound bird impact at the greater of V_C at SL or $0.85 V_C$ at FL80. (The FAA stated it was not the intention of the rule to make the birdstrike criteria more stringent at altitude.)

(iii) *Special Conditions:*

Issue Paper A-2 Proposed Special Condition – Limit Engine Torque Loads for Sudden Engine Stoppage (§25.361) – Boeing proposed treating this as an ultimate load on the grounds the current rule was less relevant to modern high-bypass engine design with fewer larger fan blades, in which out-of-balance loads can be significant. The latter must be investigated.

Issue Paper E-1 Special Condition – HIRF (§25.901, 25.1333 & 25.1431) – A special condition was needed to require showing there would be no adverse effects from high-intensity radiated fields on the electrical and electronic systems which perform critical functions.

(iv) *Equivalent Level of Safety Findings:*

Issue paper A-5 ESF §25.395(a) Lateral Control System Load Factors – Boeing proposed not applying the 125 percent of the computed hinge moment to the components of the aileron system which are designed as shear-outs, because the regulations do not consider such load-limiting devices. As for previous 737 models, only the 1.5 ultimate load factor is applied.

Issue paper A-9 ESF §25.613 Material Design Values – This requires design values to be established within specified probability confidences. The 737-800 uses no new materials or fastenings, but Boeing traditionally has used materials which have not strictly complied with the requirement. They were accepted on the basis of successful history and Boeing substantiation data.

Issue paper C-1 ESF §25.813(c)(1) Amdt 25-32; §25.813(c) Amdt 25-76; §25.562(c)(8) Amdt 25-64 Emergency Exit Access – For the 737-700 with the “traditional” overwing exit an ESF was granted to allow 2” compression of the outboard seat cushion as encroachment in the exit area, as for the 737-300. Boeing provided compensating factors, including unobstructed aisle widths of 13” offset 6.5” from the exit centreline when triple seats are located adjacent to exits. (The benefits of which have been shown by CAMI testing.)

Issue paper C-3 ESF §25.812(b)(1)(i) Emergency Exit Locator and Marking Signs – Some variation in stroke-width ratio was accepted because the readability was not affected.

Issue paper C-4 ESF §25.810(a)(1)(ii) Escape Slides – Because of the length of the activation lanyard needed to allow for door movement there are some (crash) configurations where the escape slide will not automatically deploy. This was accepted because the manual inflation handle is accessible and obvious. Also a low sill-height with uninflated slide is no different to the case where the door is less than 6 feet from the ground, when no slide is required.

Issue paper F-1 ESF FAR Parts 25/36 – Use of 1-g Stall Speed – Boeing elected to use the 1-g stall speeds, rather than “traditional” V_{MIN} stall speeds, as reference datum for regulatory compliance. This was accepted by the FAA with imposition of some criteria for stall warning and manoeuvring margins.

Issue paper F-4 ESF §25.101, §25.105, §25.109, §25.113, §25.115, §25.735 Rejected Takeoff Performance – Boeing proposed using the accelerate-stop distance requirements contained in NPRM 93-8 in lieu of the respective FAR. (The dry runway criteria are less stringent, but the wet runway and worn brake provisions are stricter.)

Issue paper P-2 ESF §25.21(b)(1), §25.933(a)(1)(ii), §25.1309(b)(1) Flight Critical Thrust Reversers – Boeing contended that the thrust reverser design protects against in-flight reverser deployment to an extent that is equivalent to showing the aircraft is capable of continued safe flight and landing under any possible position of the thrust reverser. This was accepted by the FAA after rigorous safety and risk analyses were carried out and compensating design assurance and continued airworthiness features were provided.

Issue Paper P-5 §25.979 Pressure Fuelling System – There is a requirement for the capability to check the proper operation of the pressure fuelling system automatic shutoff function before each fuelling. However the Boeing design does not allow checking of the float switch. This was accepted on the basis of reliable service on other 737 models plus some other factors which will prevent structural and fuel system damage in the event of a float switch failure.

Issue paper S-17 ESF §25.1389(b)(3) Position Lights – The forward and rear position lights exceed the maximum allowable intensities for overlap areas A and B. This was accepted as the overlap areas are narrow, do not affect signal clarity and provide greater overall intensity.

(v) *Airworthiness Limitations:*

See Airworthiness Limitations and Certification Maintenance Requirements Section 9 of Boeing 737-600/700/800 Maintenance Planning Document D626A001-CMR.

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The 737-800 has been certificated under the noise requirements of FAR Part 36, including up to Amendment 36-24.

(ii) *Compliance Listing:*

See AFM or the applicable Supplement, Section 4 – Noise Characteristics

(4) Certification Compliance Listing:

Boeing Report D045A010 – FAA Compliance Checklist 737-600/700/800

Boeing Report D045A010-1 – FAA Compliance Checklist 737-800

(5) Flight Manual:

Basic Manual: FAA-Approved Boeing Model 737-800 Airplane Flight Manual – Boeing Document No. D631A001

Specific Versions: D631A001.8Q8 – CAA Accepted as AIR 2706

D631A001.8FE – CAA Accepted as AIR 2847

D631A001.8BK – CAA Accepted as AIR 2855

D631A001.838 – CAA Accepted as AIR 3104

D631A001.8SH2 – CAA Accepted as AIR 3842

NOTE: Consult the CAA for details of any flight manuals accepted after the issue of this Type Acceptance Report.

(6) Operating Data for Aircraft and Engine:

(i) *Maintenance Manual:*

Boeing 737-800 ILF AMM – Document D633A101-ILF

Boeing 737-800 ILF Wiring Diagram Manual – Document D280A106-ILF

Boeing 737-800 ILF System Schematic Manual – Document D280A206-ILF

Boeing 737-800 Structural Repair Manual – Document D634A210

(ii) *Current service Information:*

Boeing 737-800 Service Bulletins/Letters

(iii) *Illustrated Parts Catalogue:*

Boeing 737-800 ILF IPC – Document D638A001-ILF

(7) Agreement from manufacturer to supply updates of data in (4), (5) and (6):

CAA 2171 dated 26-10-00 from K E Kaulia – Manager Certification Delivery and Fleet Support, Single Aisle Platform, Boeing Commercial Airplane Group

Note: Since the original granting of the type acceptance certificate Boeing has provided the CAA with access to the website www.myboeingfleet.com. This contains all the applicable technical documentation for the aircraft variants/serial numbers for which access has been authorised.

(8) Other information:

ILFC Detail Specification Model 737.8Q8 Doc. D6-38808-18 – Rev H 27/10/00
Virgin Blue Detail Spec. Model 737-8FE Doc. D019A001VOZ38P-1 – Rev.A
CIT Aerospace Detail Spec. 737-8BK Doc. D019A001TCI38P-3 – Rev. New
QANTAS Airways Detail Spec. 737-838 Doc. D019A001QAN38P-1 – Rev.F

B-H430-03-4320 Letter of Definition 737-8FE YJ865 FAA Project TD7808SE-T
B-H340-03-4625 LOD 737-8FE Follow-On Airplane YJ866/TD7854SE-T
B-H340-09-01295 Boeing Letter (includes details of Major Changes to YL566/7)

Detail Specification – Air Lease Corporation (HAZ)/Air Vanuatu (VAN) – Model 737-8SH Doc. D019A001VAN38P-1-42052 YT813 – Rev. New January 15, 2016

737-800 Operations Manual – Document D6-27370
737-800 Maintenance Planning Data – Document D626A001
737-800 Dispatch Deviation Guide – Document D6-32545
737-800 Maintenance Review Board – Document D626A001-MRBR
737-600/700/800 ETOPS Configuration C.M.P. – Document D044A007

5. New Zealand Operational Rule Compliance

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance 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	FAR Part 25 para §25.811(a)(e) & (f) at Amendment 25-46
B.2	Crew Protection Requirements – Agricultural Aircraft	Not Applicable – 737-800 not agricultural aircraft

Appendix C - Air Transport Aircraft - More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	FAR Part 25 para §25.809(b) at Amendment 25-72
C.2.1	(b)(3) Additional Emergency Exits – > 23 passengers	Meets FAR Part 25 Certification requirements
C.2.2	Emergency Exit Evacuation Equipment – Descent means	FAR Part 25 para §25.810(a) at Amendment 25-72 (See ESF)
C.2.3	Emergency Exit Interior Marking – Size and colour; be self-illuminating; minimum brightness 160 microlamberts	FAR Part 25 para §25.811(e) Amendment 79, §25.812(b) Amendment 58 (see Equivalent Safety Finding)
C.3.1	Landing Gear Aural Warning - Automatic Flap Linking	FAR Part 25 para §25.729(e) at Amendment 25-75

Appendix D - Air Transport Aircraft - More than 19 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
D.1.1	Exit Types - Shall be those specified in FAR 25.807 in effect on 29 March 1993	FAR Part 25 para §25.807 at Amendment 25-72 (except 25.807(c)(3) is at Amendment 25-15)
D.1.2	Floor Level Exits – Definition	FAR Part 25 para §25.807(a) at Amendment 25-72
D.2.1	Additional Emergency Exits – Must meet requirements	(a) Complies (b) Not Applicable – no ventral/tailcone exits
D.2.2	Emergency Exit Access – All Required Exits must have: Passageway unobstructed 500m wide between areas and leading to a Type I or II Exit; Crew assist space; Access to Type III or IV Exit is unobstructed Internal doors must be able to be latched open –placarded	FAR Part 25 para §25.813 at Amendments 25-45 and 25-77 (as applicable to any changed structure). Boeing LOPA-378-0850 Not Applicable – No internal doors
D.2.3	Emergency Exit Operating Handles – Markings/Lighting	FAR Part 25 para §25.811(e) at Amendment 25-79
D.2.4	Emergency Exit Evacuation Equipment – Descent means	FAR Part 25 para §25.810(c) at Amendment 25-72 – See Detailed Spec. Section 25-61-00
D.2.5	Emergency Exit Escape Route – Must be slip resistant	FAR Part 25 para §25.810(c) at Amendment 25-72
D.2.6	Emergency Lighting (a) Switch Provisions; Uninterrupted Power; Last 10 min. (b) Descent Illumination - Automatic and Independent	FAR Part 25 para §25.812(f) and (i) at Amendment 25-58 FAR Part 25 para §25.812(h) at Amendment 25-58
D.2.7	Emergency Interior Lighting – independent supply; min. illumination; incl. floor proximity escape path markings	FAR Part 25 para §25.812(c) and (e) at Amendment 25-58 See Boeing Detailed Spec. Section 33-51-00
D.2.8	Emergency Exterior Lighting – in effect 30-04-72, or later	Meets FAR Part 25 certification requirements after 1-5-72
D.2.9	Emergency Exit Interior Marking – Clears, instructions Locations signs above routes, by exits, on bulkheads – Meets certification requirements; min. brightness 250 mlb.	FAR Part 25 para §25.811(b) and (d) at Amendment 25-46 Meets FAR Part 25 certification requirements at Amendment 25-77 dated July 1992.
D.2.10	Emergency Exit Exterior Markings - 2” contrasting band; opening instructions in red or bright chrome yellow;	FAR Part 25 para §25.811(f) (See Equivalent Safety Finding) Colour of markings to be determined on a individual basis
D.3	Lavatory Fire Protection - Placards; Exterior ashtray; Waste Bin - Sealed door; built-in fire extinguisher; smoke detector system with external warning	FAR Part 25 para §25.791(d) at Amendment 25-72 FAR Part 25 para 25.853(d) and (e) at Amendment 25-72 (See ESF) – See Detailed Spec. §25-41-00 and §26-14-00
D.4	Materials for Compartment Interiors - T/C after 1.01.58: (b) Manufactured after 20/8/90 - Meet heat release rate and smoke tests of FAR Part 25 in effect 26.09.88 (c) Seat cushions (except flightdeck) must be fireblocked	FAR Part 25 para §25.853(c) at Amendment 25-72 FAR Part 25 para §25.853(b) at Amendment 25-72
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 (c) Liners shall be separate from the aircraft structure	FAR Part 25 para §25.855 (c) at Amendment 25-72 – See Detailed Spec. Section 25-50-00.020 FAR Part 25 para §25.855(b) at Amendment 25-72

Compliance with the following additional NZ operating requirements has been reviewed (for the Models 737-8FE/-8BK) 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	Shoulder Harness if Aerobatic; >10 pax; Flight Training	FAR Part 25 para §25.785 – See Detailed Spec. §25-11-10
91.507	Pax Information Signs – Smoking, safety belts fastened	FAR Part 25 para §25.791 – See Detailed Spec. §33-24-00
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	FAR 25.1303(b)(1) ** FAR 25.1303(b)(1) ** FAR 25.1303(b)(2) ** FAR25.1303(a)(3) See Det. Spec. §34-23-20 FAR 25.1305(a)(2) See Det. Spec. §28-41-00 FAR 25.1305(c)(3) * FAR 25.1305(a)(4) *
		(8) Coolant Temp (9) Oil Temperature (10) Manifold Pressure (11) Cylinder Head Temp. (12) Flap Position (13) U/C Position (14) Ammeter/Voltmeter
		N/A – Turbojet FAR 25.1305(a)(6) * N/A – Turbojet N/A – Turbojet FAR 25.699(a) See Det. Spec. §27-50-00.040 FAR 25.729(e) See Det. Spec. §32-60-00 FAR 25.1351(6)
		* Engine parameters and indicators shown on the engine display unit – See Detailed Spec. §31-62-12 and §77-00-00 ** Flight data displayed in EFIS/Map format on EFIS display unit – See Detailed Spec. §31-62-32 NOTE: Unless otherwise specified all reference to Detailed Specification means Document D6-38808-18
91511 Night	(1) Turn and Slip (2) Position Lights	FAR 25.1303(b)(4) FAR 25.1389/§33-43-00
91.513	VFR Comm. Equipment	(3) Anti-collision Lights (4) Instrument Lighting FAR 25.1401/§33-44-00 FAR 25.1381/ §33-13-00
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	Single HF (ARINC 716) fitted as standard – See Detailed Spec. §23-11-00 Dual VHF (ARINC 716 or 750) fitted as standard – See Detailed Spec. §23-12-00 SELCAL (ARINC 714) fitted as standard, provision for SATCOM and ACARS
91.519	IFR communication and navigation equipment	(5) OAT (6) Time in hr/min/sec (7) ASI/Heated Pitot (8) Rate of Climb/Descent FAR 25.1303(a)(1)/§34-21-50 FAR25.1303(a)(2)/§31-25-00 See Detailed Spec. §30-30-00 FAR 25.1303(b)(3)
91.523 Emgcy Equip.	(a) More than 10 pax – First Aid Kits per Table 7 – Fire Extinguishers per Table 8 NOTE: The VB aircraft specification is for four Halon 1211 extinguishers instead of the standard Boeing fit of three Halon and one water. (FAA guidelines specify 5lb. of Halon must be used to replace a water fire extinguisher.) CASA granted a waiver against FAR 25.851(a)(1) & (7). The applicant elected to re-fit the water extinguisher for NZ-registered aircraft because of the time frame for certification. (b) More than 20 pax – Axe readily acceptable to crew (c) More than 61 pax – Portable Megaphones per Table 9 NOTE: For details of emergency equipment on VB aircraft see VB Engineering Order EO 25-139	Dual VOR meeting ARINC 711 fitted as standard – See Detailed Spec. Section 34-51-00 Dual DME meeting ARINC 709 fitted as standard – See Detailed Spec. Section 34-55-00 Single ADF meeting ARINC 712 fitted as standard - See Detailed. Spec. §34-57-00 (Also states there are partial provisions for a second ADF system) Dual IRS and ADIRU meeting ARINC 704 fitted as standard – See Detailed Spec. §34-21-00 Dual GPS meeting ARINC 755 fitted as standard – See Detailed Spec. Section 34-58-00
91.529	Emergency Locator Transmitter – TSO C126 406 MHz	Fitted as Standard – See Boeing Detailed Spec. §25-64-10 Fitted as Standard – See Boeing Detailed Spec. §26-26-00
91.531	Oxygen Indicators - Volume/Pressure/Delivery	Fitted as Standard – See Boeing Detailed Spec. §25-64-40 Fitted as Standard - See Boeing Detailed Spec. §25-64-20
91.535 Press. A/c	(a)(1) Flight Crew Member On-Demand Mask; 15 min PBE (2) 1 Set of Portable 15 min PBE (3) Crew Member – Pax O ₂ 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 – Supplemental O ₂ Masks for all Pax/Crew – Supplemental Mask in Washroom/Toilet Above FL300 – Total Outlets Exceed Pax by 10% Auto Presented > FL140, Manual Means of Deployment	To be determined on an individual aircraft basis (Artex P/N 453-0004 [Commercial Model B406-1, certified to TSO C126] fitted as standard on YJ865)
91.541	SSR Transponder and Altitude Reporting Equipment	FAR Part 25 paragraphs §25.1441(c) and (d)
91.543	Altitude Alerting Device - Turbojet or Turbofan	Three independent oxygen systems are fitted as standard – See Detailed Spec. §35-00-00. Four portable cylinders installed in pax. Compartment – See DS §35-30-00.010 and Fig.25-2 (Five portable bottles fitted on 737-8FE – See DS §25-64-60) - Pax. System designed to provide supply for emergency descent as per specified descent profile (12 minutes) Protective breathing of 300 l/crew member provided Crew system has 39 cu. ft. capacity. Note: After evaluation of the requirements by Pacific Blue it was determined an additional two 311 litre capacity oxygen bottles were needed. (See Virgin Blue EO 25-159 Issue 1)
91.545	Assigned Altitude Indicator	Dual Mode S Transponders meeting ARINC 718 fitted as standard – See Boeing Detailed Spec. Section 34-53-00
A.15	ELT Installation Requirements	Fitted as standard – See Detailed Spec. §22-10-10/§34-16-00 Not Applicable – Altitude Alerting Device fitted
		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)	FAR Part 25 is a Part 21 Appendix C standard
121.357	Additional Equipment - (1) Windscreen Wiper (2) Door, Key (3) Door to emergency exit	Fitted as standard – See Boeing Detailed Spec. §30-43-00 Fitted as standard – See Boeing Detailed Spec. §25-18-00 Not Applicable – No doors between passenger compartments
121.359	Night Flight - Landing Light, Light in each pax cabin	Fitted as standard – See Det. Spec. §33-42-10 and 33-20-00.
121.361	IFR Operations	Speed, Alt, spare bulbs/fuses
121.363	Flights over water	Liferafts
121.365	Emergency Equipment	Per §91.523 and EROPS kit
121.367	Protective Breathing Equipment (PBE)	TSO C99 cockpit equipment TSO C115 cabin equipment
121.369	P/A, Intercom	Meets FAR §121.318 and 319
	NOTE: The standard VB Specification calls for Sennheiser HME1410KA boom mic headsets, which are not FAA Approved. The FAA required a waiver from CASA against various FARs (See letter dated April 18, 2003) for the issue of the export certificate of airworthiness. The CAA requested a technical justification for acceptance of the headsets in NZ. Because of the time frame involved the applicant elected to re-fit the standard Boeing headsets.	
121.371	Cockpit Voice Recorder – Appendix B.5 requires TSO C84/C123	CVR meeting ARINC 757 fitted as standard – See Detailed Spec. §23-70-00 (Allied Signal P/N 980-6020/22-001 fitted as BFE on ILFC and VB aircraft.)
121.373	Flight Data Recorder – Appendix B.6 requires TSO C124	DFDR meeting ARINC 747 fitted as standard – See Detailed Spec. §31-31-10 68 parameters recorded – See Detailed Spec. §31-31-20 (Allied Signal P/N 980-4700-042 fitted as BFE on ILFC and VB aircraft.) Boeing confirmed 737-800 are equipped at production for compliance with FAR 121.344 Appendix M [88 parameters] effective 12.09.97. (YJ865-66 also comply with NPRM 99-19 [91 parameters] although this was not made a Rule.)
121.375	Additional Attitude Indicator	Fitted as standard – See Boeing Detailed Spec. §31-62-34
121.377	Weather Radar – Appendix B.8 requires TSO C63	Wx meeting ARINC 708 fitted as standard – See Detailed Spec. §34-43-00 (Rockwell P/N 622-5132-106 fitted as BFE on ILFC aircraft.)
121.379	GPWS – Appendix B.9 requires TSO C92	GPWS meeting ARINC 723 fitted as standard – See Detailed Spec. §34-46-00

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.

Certification Issues

Model 737-838:

CASA Delivery Waivers

The first three aircraft YL566-568 were delivered in the QANTAS configuration with six exceptions for which CASA granted a waiver, as follows:

- 1&2. The fire extinguishers fitted were BFE and were not Boeing approved, and in addition no water type are fitted. (FAA AC 25-17 guidelines require that at least one fire extinguisher appropriate for a Class A fire should be provided.)
3. Exit row seat recline over-ride and video screen tilt back. Jetconnect elected to disable the seat back recline lockout system. However the video screen did not comply with FAA requirements or NZCAR Part 26 D.2.2(a)(3). This was accepted in NZ as an Equivalent Safety Finding based on the ease of retraction, placarding and cabin attendant procedures to ensure screens are stowed for takeoff and landing. (See Certification Review Item D-1.)
4. Seat belt extension with supplementary baby loop. Installed to meet Australian rules and acceptable in New Zealand under NZCAR §91.207(d)(1).
- 5&6. Acceptance of FAA STCs. (These are acceptable in NZ under Part 21 Appendix D.)

Oxygen System NZCAR Compliance

The passenger oxygen system uses chemical oxygen generators. Boeing Letter reference B-H340-09-01295 provides system details to show compliance with NZCAR §91.535.

FAA Cabin Configuration Approval

There were a number of issues identified by the FAA during the certification of the cabin interior, which required rectification action. These included:

1. The FAA published Memorandum 02-115-21, dated 21/11/02, which addresses FAA policy on the stowage, retention, and breakaway of deployable individual video systems (IVS) installed in transport airplane seats. On YL566-568 the Business Class Seat Video Monitors and Arms did not meet this guidance and were not padded. Boeing developed an AMOC for showing compliance with FAR§25.785(k), which involves ensuring that if the monitor does not fully move out of the head strike path with a force of 10 pounds or less, then the physical characteristics of the installation shall meet minimum defined criteria.
2. The exit row outside armrest mounting stub was deemed a hazard because it was within the 35 inch head strike arc. It was padded with a minimum of an inch of ensolite.
3. A potential finger pinch hazard was identified under the economy class seat armrest. A cover piece was manufactured and secured in place with tie-wraps.
4. YL566-568 were originally intended for delivery with seats meeting FAR §25.562, but this was not completed in time. Rush Revision RR97164-42 replaced the inflatable seat belts with standard items and amended the seat dataplate. (The aircraft still complies with FAR §121.311(j) by date-of-manufacture.)

Attachments

The following documents form attachments to this report:

- Photographs first-of-type variant 737-8FE s/n 33796 ZK-PBA
- Three-view drawing Boeing Model 737-800 “NG”
- Copy of FAA Type Certificate Data Sheet Number A16WE

Sign off

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 David Gill
 Team Leader Airworthiness

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 Checked – Greg Baum
 Airworthiness Engineer

Appendix 1**List of Type Accepted Variants:**

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
737-8Q8	Polynesian Limited	1/21B/2	14 November 2000
737-8FE	Pacific Blue Airlines (NZ) Ltd	4/21B/9	13 January 2004
737-8BK	Pacific Blue Airlines (NZ) Ltd	4/21B/20	26 February 2004
737-838	Jetconnect Limited	9/21B/15	16 September 2009
737-8SH	Air Vanuatu (Operations) Ltd	18/PIA/6	24 August 2018

NOTE: Subject to access to the serial-number specific operating documentation on the myboeingfleet.com website, or provided directly by the operator or Boeing, CAA has granted Type Acceptance to all Boeing 737-800 variants which comply with the type certification basis referenced in this report.