
Type Acceptance Report

TAR 1/21B/2 – Revision 5

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 Section 2, 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 notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand, which are listed in Section 2. The history of the Boeing 737-800 Series type acceptance in New Zealand under FAA type certificate A16WE is listed in Appendix 1.

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 up to 36-20
Engine: CFM56-7B Series *
Type Certificate: E000055EN
Issued by: Federal Aviation Administration
Type Certificate: E.004
Issued by: European Union Aviation Safety Agency

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

NOTES: Because Boeing provides CAA access to the myboeingfleet.com website for all serial numbers on the NZ Register, 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 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.

3. Application Details and Background Information

The original application for type acceptance of the Boeing Model 737-8Q8 was from Polynesian Airlines dated 4 July 2000. The first-of-type example was manufacturer 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 MSN 33796, Line No.1377, Tab No. YJ865, registered ZK-PBA. 737-8FE 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. 737-8BK 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. 737-838 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 range 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, 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. 737-8SH 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.

The report was raised to Revision 5 to add the 737-800BCF configuration. This is not a separate specific variant but is a major design change applied to existing aircraft which converts 737-800 passenger airplanes into freighters, in accordance with a Boeing Top Drawing embodied under a Service Bulletin. This involves installation of a main deck cargo door (MDCD), installation of a Class E main deck cargo compartment and strengthened aircraft structure such as floors. The airplanes that are modified as a result of this project are referred to by Boeing as 737-800BCF airplanes (i.e., Boeing Converted Freighter) for marketing purposes. Validation was required because an updated certification basis was used with several deviations. Installation of two STCs for a Cargo Handling System (CHS) and Rigid Cargo Barrier (RCB) are a concurrent requirement, and all passenger windows are removed and replaced with window plugs in accordance with an existing STC. The first-of-type example was MSN 29985 registered ZK-TXE. Type acceptance of the 737-800BCF was granted on 26 May 2023.

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
Type Certificate Data Sheet no. A16WE at Revision 73 dated March 15, 2023
– 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 specified paragraphs, plus the addition of a later amendment status up to 25-88 for some paragraphs, 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. FAR Part 26 was added to the certification basis for some changes as applicable by date of manufacture, and additional special conditions, ELOS and exemptions were added for specific installations after the original date of type certification.

Under FAR 21.101 the 737-800BCF was considered a significant major design change and the certification basis was therefore updated for individual FAR 25 paragraphs up to Amendment 25-138 for areas affected by the change. See the TCDS and FAA Issue Paper G-1 for full details. One special condition, one exemption and two ELOS are applicable to the 737-800BCF conversion.

This is an acceptable certification basis in accordance with NZCAR Part 21B paragraph §21.41, because FAR Part 25 is the basic design standard for Transport Category Airplanes called up under Part 21 Appendix C. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) *Exemptions:*

BOEING 737-600/700/800:

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 – Flight deck seats were exempt 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 – §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.)

BOEING 737-800BCF:

Exemption No. 17218 – This permits up to four non-crewmembers (supernumeraries) to be carried aft of the flightdeck and up to two access into the Class E cargo compartment during flight to attend to cargo types requiring care or inspection, or both (e.g., live animals or hazardous materials). The aircraft must have suitable oxygen and safety equipment with placards, and the supernumeraries must be fit and appropriately trained and briefed.

(iii) *Special Conditions:*

BOEING 737-600/700/800:

25-ANM-132:

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 as the current rule was less relevant to modern high-bypass ratio fan engine design with fewer larger fan blades that will not seize and produce transient torque loads in the same manner envisioned by the current §25.361(b)(1) related to "sudden engine stoppage". Out-of-balance loads can be significant and were required to be investigated.

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

25-308-SC Flammability Reduction Means – The centre wing tank includes a new flammability reduction means that uses a nitrogen generation system to reduce the oxygen content so that exposure to a combustible mixture is substantially minimized. This is intended to reduce the average flammability exposure of the fleet to a level equivalent to 3% of the airplane operating time. Boeing will comply with FAR 25.981 at Amendment 25-102 effective June 6, 2001, but the Special Condition addresses novel design features.

25-358-SC Seats with Non-Traditional Large Non-Metallic Panels – Current rules do not require seats to meet the stringent flammability requirements of large cabin interior panels. To provide the same passenger protection non-traditional, large (> 1.5 m²), non-metallic panels fitted to aircraft seats in lieu of a traditional metal frame covered by fabric must meet FAR 25, Appendix F, Parts IV and V, heat release and smoke emission requirements.

25-386-SC Inflatable Lapbelts Installed – This was issued to address the technology of inflatable lapbelts. This covered: performance requirements for a range of passenger stature and situations, including holding an infant, pregnancy and child occupation; buckle integrity and activation confirmation; system functioning with power loss or HIRF and lightning interference; and general protection from injury during normal or inadvertent deployment, including gas or particulate release. The flammability requirements were also changed because the specialised materials used could not meet the vertical burn test.

BOEING 737-800BCF:

25-347-SC Interaction of Systems and Structures – Originally issued to 737-900ER this applies to airplanes equipped with systems that may affect structural performance, either directly or by failure or malfunction. The effects of these systems (such as load alleviation, flutter suppression, or stability augmentation) were required to be taken into account in the certification analysis, which had to include consideration of normal operation and of failure conditions with required structural strength levels related to the probability of occurrence.

(iv) *Equivalent Level of Safety Findings:*

BOEING 737-600/700/800:

AT0328SE-T-A-5: Issue paper A-5 ESF §25.395(a) Lateral Control System Load Factors – Boeing proposed not applying the 125 % of the computed hinge moment to the components of the aileron system designed as shear-outs, because the rules do not consider such load-limiting devices. As for previous 737 models, only the 1.5 ultimate load factor is applied.

AT3907SE-T-A-15: 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. Boeing traditionally has used materials which have not strictly complied, but were accepted on the basis of successful history and Boeing design data.

TD8301SE-T-C-1: 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 – The 737-700 with “traditional” overwing exit was granted an ESF to allow 2” compression of the outboard seat cushion as encroachment in the exit area, as was allowed 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.)

TD2695SE-T-C-1: Issue paper C-1 ESF §25.811(f) Exterior Exit Markings – The coloured exit outline band must have a specified contrast. A lower reflectance difference was allowed for the door sill considered part of the exit band, provided the width does not exceed 5” at the centreline, the remaining area reflective difference exceeds FAA minimums and evaluation is conducted for sill areas that extend more than 4” above the base of the door.

AT0328SE-T-C-3: Issue paper C-3 ESF §25.812(b)(1)(i) Emergency Exit Locator & Marking Signs – Some variation in stroke-width ratio was accepted because the readability was not affected.

AT0328SE-T-C-4: Issue paper C-4 ESF §25.810(a)(1)(ii) Escape Slides – Because of the activation lanyard length 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 of the door less than 6 feet from the ground, when no slide is required.

AT0328SE-T-F-1: 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 the imposition of some criteria for stall warning and manouvering margins.

AT0328SE-T-F-4: 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 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.)

AT0328SE-T-P-2: 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 deployment to an extent 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.

AT0328E-T-P-5: 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 that will prevent structural or fuel system damage in the event of a float switch failure.

AT0328SE-T-F-3: Issue paper F-3 ESF §25.1301 Return Landing Capability – Modern twin-engined aircraft with high take-off performance may not be capable of a return landing without exceeding capabilities. Compliance with §25.1301 may be demonstrated by a combination of failure analysis, equipment qualification testing, and/or the installation of a fuel jettison system. Boeing proposed compliance based on consideration of climb capability (FAR §25.1001); high margins to flap placard speeds; controllability by design features; landing distances (actual distances including wet runway) maximum brake energy, tire speed limits; and operational procedures for decreasing the potential for a landing overrun event

AT0328SE-T-S-17: 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.

BOEING 737-800BCF:

ELOS Memo AT8167SE-T-ES-1 – FAR §25.857(c)(1) – This allows inhibiting the Class C lower lobe smoke detectors while in the main deck Class E cargo compartment firefighting mode subject to certain specified conditions being met, to preclude inadvertent smoke detection in other compartments. This was based on the rarity of event and low probability of two independent fires.

ELOS Memo PS05-0020-ES-3 – FAR §25.831(g) – The rule limits the exposure time to high temperatures in the crew and passenger compartments to prevent a hazard to continued safe flight and landing. The FAA has determined it is acceptable to provide human physiological limits (rather than temperature/humidity exposure limits) during failure conditions based on the draft rule from the Mechanical Systems Harmonization Working Group (MSHWG) final report.

(v) *Airworthiness Limitations:*

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

The inspection requirements for a 737-800BCF conversion are found in Boeing 737 Airworthiness Limitations Document D140A006.

(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. (Stage 3 or Stage 4 noise rules based on airplane serial number [related to AFM contents and weights values]).

The 737-800BCF conversion was assessed as a no acoustic change.

(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

FAA Issue Paper G-1 – Certification Basis Boeing 737-800BCF

FAA Project TS14-0042 – 737-800 Boeing Converted Freighter – Cert. Plan

CP TS14-0042-1 – 737-800 BCF – Structures Certification Plan

CP TS14-0042-2 – 737-800 BCF – General Airplane Certification Plan

CP TS14-0042-3 – Environmental Control Systems – Air Systems Cert. Plan

CP TS14-0042-4 – Environmental Control Systems – Cargo Fire Protection

CP TS14-0042-5 – 737-800 BCF – Payloads Certification Plan

CP TS14-0042-6 – 737-800 BCF – Doors Certification Plan

(5) Flight Manual:

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

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

D631A001.8FE – CAA Accepted as AIR 2847

D631A001.8BK – CAA Accepted as AIR 2855

D631A001.8BK2 – CAA Accepted as AIR 3987

D631A001.838 – CAA Accepted as AIR 3104

D631A001.8SH2 – CAA Accepted as AIR 3842

D631A001.8B53 – CAA Accepted as AIR 3985

D631A001.8B5 – CAA Accepted as AIR 3988

D631A001.8FH – CAA Accepted as AIR 3989

NOTE: Consult CAANZ 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 (with 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

Boeing SB 737-00-1025 – Collector Service Bulletin for Modification of 737-800 Passenger Airplane to a Boeing Converted Freighter – Top Project Drawing 800A0003 Sheet 2 through 141.

Boeing SB 737-00-1025 – Collector Service Bulletin for Modification of 737-800 Passenger Airplane to a Boeing Converted Freighter – Top Project Drawing 800A0003 Sheet 142 and beyond.

Top Drawing 800A0003 – Top Project Drawing 737BCF – Sheet 77: YD125

Top Drawing 800A0003 – Top Project Drawing 737BCF – Sheet 84: YJ867

Top Drawing 800A0003 – Top Project Drawing 737BCF – Sheet 145: YD261

Top Drawing 800A0003 – Top Project Drawing 737BCF – Sheet 156: YL056

Boeing Document D285A018-D125 – Electrical Load Analysis Model 737-800 YD125 (applies after 737-800BCF freighter conversion modifications.)

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) 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 cert. 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 – <i>See Detailed Spec. §25-11-10</i>
91.507	Pax Information Signs – Smoking, safety belts fastened	FAR Part 25 para §25.791 – <i>See Detailed Spec. §33-24-00</i>
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) <i>See Det. Spec. §34-23-20</i> FAR 25.1305(a)(2) <i>See Det. Spec. §28-41-00</i> 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 FAR 25.699(a) <i>See Det. Spec. §27-50-00.040</i> FAR 25.729(e) <i>See Det. Spec. §32-60-00</i> FAR 25.1351(6)
		* Engine parameters and indicators shown on the engine display unit – <i>See Detailed Spec. §31-62-12 and §77-00-00</i> ** Flight data displayed in EFIS/Map format on EFIS display unit – <i>See Detailed Spec. §31-62-32</i> 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 – <i>See Detailed Spec. §23-11-00</i> Dual VHF (ARINC 716 or 750) fitted as standard – <i>See Detailed Spec. §23-12-00</i> SELCAL (ARINC 714) fitted as standard, provision for SATCOM and ACARS EFIS <i>Detailed Spec. §34-23-10</i> FAR 25.1303(b)(6) FAR 25.1331(a) FAR 25.1303(b)(2)
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 FAR 25.1303(a)(2)/§31-25-00 <i>See Detailed Spec. §30-30-00</i> 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 – <i>See Detailed Spec. Section 34-51-00</i> Dual DME meeting ARINC 709 fitted as standard – <i>See Detailed Spec. Section 34-55-00</i> Single ADF meeting ARINC 712 fitted as standard - <i>See Detailed. Spec. §34-57-00 (Also states there are partial provisions for a second ADF system)</i> Dual IRS and ADIRU meeting ARINC 704 fitted as standard – <i>See Detailed Spec. §34-21-00</i> Dual GPS meeting ARINC 755 fitted as standard – <i>See Detailed Spec. Section 34-58-00</i> Fitted as Standard – <i>See Boeing Detailed Spec. §25-64-10</i> Fitted as Standard – <i>See Boeing Detailed Spec. §26-26-00</i>
91.529	Emergency Locator Transmitter – TSO C126 406 MHz	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)
91.531	Oxygen Indicators - Volume/Pressure/Delivery	FAR Part 25 paragraphs §25.1441(c) and (d)
91.535 Press. A/c	(a)(1) Flightcrew 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	Three independent oxygen systems are fitted as standard – <i>See Detailed Spec. §35-00-00</i> . Four portable cylinders installed in pax. Compartment – <i>See DS §35-30-00.010 and Fig.25-2 (Five portable bottles fitted on 737-8FE – See DS §25-64-60)</i> - Pax. System designed to provide supply for emergency descent as per specified descent profile (12 min.s) Protective breathing 300 l/crew member provided Crew system has 39 cu. ft. capacity. Note: After evaluation of the requirements by PBA it was determined an additional two 311 litre capacity oxygen bottles were needed. (See Virgin Blue EO 25-159 Issue 1)
91.541	SSR Transponder and Altitude Reporting Equipment	Dual Mode S Transponders meeting ARINC 718 fitted as standard – <i>See Boeing Detailed Spec. Section 34-53-00</i>
91.543	Altitude Alerting Device - Turbojet or Turbofan	Fitted as standard– <i>See Detailed Spec. §22-10-10/§34-16-00</i>
91.545	Assigned Altitude Indicator	Not Applicable – Altitude Alerting Device fitted
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)	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 <i>Boeing Detailed Spec. §30-43-00</i> Fitted as standard – See <i>Boeing Detailed Spec. §25-18-00</i> Not Applicable – No doors between passenger compartments
121.359	Night Flight - Landing Light, Light in each pax cabin	Fitted as standard – See <i>Det. Spec. §33-42-10 and 33-20-00.</i>
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 <i>Detailed Spec. §23-70-00</i> (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 <i>Detailed Spec. §31-31-10</i> 68 parameters recorded – See <i>Detailed Spec. §31-31-20</i> (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. (Y)865-66 also comply with NPRM 99-19 [91 parameters] although this was not made a Rule.)
121.375	Additional Attitude Indicator	Fitted as standard – See <i>Boeing Detailed Spec. §31-62-34</i>
121.377	Weather Radar – Appendix B.8 requires TSO C63	Wx meeting ARINC 708 fitted as standard – See <i>Detailed Spec. §34-43-00</i> (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 <i>Detailed Spec. §34-46-00</i>

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 details to show compliance with CAR §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 an inch minimum 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:

Copy of FAA Type Certificate Data Sheet Number A16WE

Sign off



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David Gill
Team Leader Aircraft Inspection



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Checked – John Marshall
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
737-800BCF	Texel Air NZ Ltd	23/21B/18	26 May 2023

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.

Appendix 2

Three-view drawing Boeing 737-800:



