
Type Acceptance Report

TAR 1/92 – Revision 5

Boeing 737-300/400

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Executive Summary

New Zealand Type Acceptance has been granted to the Boeing 737-300/400 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 §21.177, 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(2).

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 Type Acceptance Certificate No. 97/01 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 accepted prior to that under NZCAR Section B.9 are 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:** 737-300
- MCTOW: 139,500 lb. (63,276 kg.) – Structural Design Weight
[See Note 10 on TCDS]
- Max. No. of Seats: 149
- Noise Standard: FAR Part 36, including Amendments through 36-12 (Stage 3)
- Engine:** CFM56-3-B1/ CFM56-3B-2/ CFM56-3C-1
Type Certificate: E2GL
Issued by: Federal Aviation Administration
Type Certificate: E.066
Issued by: European Aviation Safety Agency
- (ii) **Model:** 737-400
- MCTOW: 150,000 lb. (68,039 kg.) – Structural Design Weight
[See Note 10 on TCDS]
- Max. No. of Seats: 188
- Noise Standard: FAR Part 36, including Amendments through 36-15 (Stage 3)
- Engine:** CFM56-3B-2/ CFM56-3C-1
Type Certificate: E2GL
Issued by: Federal Aviation Administration
Type Certificate: E.066
Issued by: European Aviation Safety Agency

3. Application Details and Background Information

The 737-300 Series was first type accepted in New Zealand on 11 May 1992 in accordance with NZCAR Section B.9. The applicant was Polynesian Airlines and the first-of-type aircraft was 737-3S3 serial number 23788, registered 5W-FAX. A second variant 737-3Q8 serial no. 26282 Tab no. PQ293 was certificated in September 1992 as 5W-ILF.

The first application for New Zealand type acceptance of the Boeing 737-300 Series under NZCAR Part 21B was from South Pacific Air Charters Ltd (Freedom Air) for the Model 737-3M8. (A model originally delivered to Trans European Airways.) Type Acceptance Certificate No.97/01 was granted on 19 February 1997, based on validation of FAA Type Certificate number A16WE, and includes the CFM56-3 Series engine based on FAA Type Certificates E2GL or E21EU. Specific applicability is limited to the coverage provided by the operating documentation supplied, in this case the Flight Manual is the determinant. There are no special requirements for import into New Zealand.

The 737-300 is a developed and stretched version of the 737-200 fitted with CFM56 fanjets. Other improvements include a modified aerofoil section (to increase cruise mach number); extended wing and tailplane tips; strengthened nose and main landing gears, kreuger flaps and stabilizer centre section; a new dorsal fin and revised wing flap track fairings. The 737-400 is a stretched derivative of the 737-300, being extended by 10 feet (72 inch plug forward of the wing and a 48 inch plug aft of the wing). The main landing gear will be made of titanium instead of aluminium and a tailskid added. The outboard wing upper and lower surfaces are strengthened and the centre wing lower skin is shot-peened. MTOW is increased to 142,000 lb (MLW and MZFW are unchanged), while a High Gross Weight version has a MTOW of 150,000 lb.

Type Acceptance was granted on 9 January 1998 for the 737-33R and on 17 April 1998 for the 737-36Q variants, after application by Air New Zealand Ltd. Subsequently 737-33R serial number 28868, which originally used a different Flight Manual, was type accepted under Work Request 0/21B/20.

The Model 737-33R is a GECAS aircraft originally ordered for Western Pacific Airlines and was delivered in a 136-seat domestic all-economy configuration. The First-of-Type example was the fifth in the series, ZK-NGA, serial number 28873, line number 2975, and tabulation number PR045. The Model 737-36Q is a Boullioun Aviation Services Inc. ordered aircraft, whose normal configuration is 146 seats in an all-economy layout and which is in service with Varig. ZK-NGB, s/n 29140 line no.3013 is the ninth aircraft in the series at A/P no. PR009, while ZK-NGC is PR014, s/n 29189 and line no.3057.

Type Acceptance was granted to the Model 737-3U3 on 16 March 1999. This model was originally produced to an order by Garuda Airlines which was cancelled, and were subsequently leased by Air New Zealand as ZK-NGD and ZK-NGE.

Type Acceptance was granted to the Model 737-319 on 14 October 1999. 737-319 is the Boeing customer designation for Air New Zealand. The aircraft specification is based on the second to last Model 737-3U3 ordered by Garuda Indonesia (S/N 28741; L/N 3079; V/N PR072). The first Model 737-319 aircraft (S/N 25606; L/N 3123; V/N PR077; R/M ZK-NGG) was delivered without a full complement of passenger seats installed, these subsequently being fitted following the arrival of the aircraft at Christchurch to an Air New

Zealand 122 seat (8 J Class and 114 Y Class) configuration. The main differences from the Model 737-3U3 aircraft are:

- Collins/Rockwell WRT-701X Weather Radar Transceiver with Predictive Wind Shear (PWS) system deactivated. This is the first WRT-701X installation on the 737-300 Series aircraft. The PWS function is not activated. The systems and configuration have been previously certified on the Model 737NG aircraft.
- Collins/Rockwell VHF-900B Communication Transceiver (triple). This is the first installation that utilizes the 8.33 kHz channel tuning capability of the VHF-900B transceiver and associated Gables G7400-32 tuning panel on the Model 737-300 Series aircraft.
- Matsushita RD-AX7271NZ02 Passenger Address System. The RD-AX7271NZ02 is the same as the RD-AX7271GA01 system certified on the first of the Model 737-3U3 aircraft ordered by Garuda Indonesia (S/N 28731; L/N 2949; V/N PR061) except for the message content.

Type Acceptance was granted to the Model 737-3K2 on 15 December 2000. The first-of-type example was serial number 26318 (line no. 2731, variable no. PS868) ex-PH-TSX, which was registered as ZK-NGK. The 737-3K2 is one of the Boeing customer models for International Lease Finance Corp., and eleven eligible serial numbers are listed in the TCDS. However the Detailed Specification and Flight Manual are only applicable to the last three production aircraft PS866-868, which are being imported by Air New Zealand as ZK-NGL, NGM, and NGK respectively. (s/n 27635 was subsequently diverted to Freedom Airlines as ZK-SJE.) They were delivered new in May and June 1995 to Transavia Airlines of Holland. These are high-weight aircraft originally providing accommodation for a single tourist class with 149 passengers. They were configured for ETOPS capability and certificated for Category IIIa automatic approach and landing.

Type Acceptance was granted to the 737-33S on 10 May 2001. The first-of-type example was serial number 29072 (line no.3012, variable no.PR101), registered as ZK-NGN. The – 33S is the customer model for Pembroke Capital Ltd and the sole example of this B733 variant was initially operated by SobelAir as OO-SLK.

The application for New Zealand type acceptance of the 737-33A and 737-376 models was from Jetconnect Limited dated 29 August 2002. Four former Ansett Worldwide Aviation Services (AWAS) 737-33A will be operated for QANTAS registered as ZK-CZR (v/n PP923 s/n 24460), ZK-CZS (v/n PP915 s/n 24030), ZK-CZU (v/n PS618 s/n 27267), and ZK-JNE (v/n PS605 s/n 25119). The first of type 737-376, also for QANTAS, was variable number PQ007 and serial number 23486 registered as ZK-JNF. Type Acceptance was granted on 16 October 2002.

The -33A model number is the customer designation for Nordstress (AWAS) B733 aircraft and is applicable to 67 serial numbers on the TCDS. (13 aircraft PP904-916 are covered by one Detailed Specification, while 45 aircraft PP917-930, PS601-629 and PS636-638 are in another.) All were on-leased to different airlines. The original cabin configuration was 148 tourist class seats at 29”/30” pitch. PP618 (s/n 27267) and on were configured for ETOPS. Some early aircraft were manufactured in compliance with CAA UK Special Conditions. The -376 is the customer number for Australian Airlines who ordered a total of sixteen aircraft (PQ001-PQ016). They were originally delivered in a 3-class layout, with either 16 first class, 36 business class and 60 economy class seats or 14/24/78 seats (PQ013 on). The original Contractual Operational Weight for the -33A/376 variants was 135,000 lb.

Type Acceptance was granted on 29 October 2002 to the 737-37Q. The first-of-type was serial no. 28548, tabulation no. PQ997, registered as ZK-NGO. The 737-37Q is a variant for Novel Leasing Ltd and was originally on the British Register.

Revision 1 of this report was issued as a complete re-format of the original type acceptance report for the 737-300, incorporating all previous variants and current CAA policy, under CAA Work Request 4/21B/26. This was an application by Freedom Air Limited for type acceptance of the 737-31S variant, which was granted on 14 May 2004. -31S is the Boeing designation for Deutsche BA, and includes Variable Numbers PR01-030 and PS961-970. They were produced as non-ETOPS aircraft configured for 136 passengers equipped with CFM56-3C-1 engines rated at 22,000 lb. However the contract for serial number 29116 was not completed and the registration ZK-SJD was not taken up.

This report was raised to Revision 2 to include the Model 737-476 after application from JetConnect Ltd dated 20 September 2005. Three aircraft are being introduced to their fleet. It was originally proposed to use s/n 24435 to 24437, but this was subsequently changed to 24430 and 24441-42, the first of which was ZK-JTP. Type acceptance was granted under Work Request number 6/21B/8 on 2 June 2006. The 737-476 is the customer designation for Australian Airlines, who received a total of 21 aircraft in four separate batches. They were originally delivered in a three class configuration (16/24/95) with 16g seats.

This report was raised to Revision 3 to include two 737-300C variants after application from Airwork Flight Operations Ltd dated 9 March 2007. The first-of-type examples were 737-3B7 serial number 23383 ZK-TLA, and 737-3Q4 serial number 24209 ZK-TLB. Type acceptance was granted under Work Request number 7/21B/34 on 20 April 2007. -3B7 is the customer identifier for US Air and s/n 23383 was one of a batch of 47 delivered with 138 tourist class seats. -3Q4 is the customer identifier for ILFC, and s/n 24209 was one of three originally delivered to TransBrazil in a 132 all-economy class arrangement.

Revision 4 added the 737-3S1, which is the manufacturer's customer designation for TACA International Airlines. One of only two examples of this variant, MSN 24834, became the first-of-type as ZK-TLE. Type acceptance was granted on 29 April 2011.

Revision 5 to this report was issued to separate out the type acceptance of the CFM56-3 Series engine, which is now covered by Type Acceptance Certificate 19/21B/6.

NOTE: 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 the CAA now accepts all variants of the Boeing 737-300 and 400 Series that have been approved against the certification basis stated on the TCDS, subject to provision of access to the applicable operating documentation.

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:

(1) State-of-Design type certificate:

- FAA Type Certificate Number A16WE – Boeing 737 Series
- FAA TCDS number A16WE at Revision 61 dated February 15, 2018
 - Model 737-300 approved November 14, 1984
 - Model 737-400 approved September 2, 1988

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Boeing Model 737-300 Series is FAR Part 25 as amended by Amendments 25-1 through 25-3, 25-7, 25-8 and 25-15, except where superseded by later amendments of individual paragraphs as detailed on the TCDS up to Amendment 25-53. (Sections §25.809, §25.811 and §25.853 are at Amdt 25-32; §25.813 is at Amdt 25-17; and §25.803, §25.812 and §25.855 are at Amdt 25-51.) A number of Equivalent Safety Findings were made, which have been reviewed and accepted by the CAA. Compliance was also shown with the optional requirements for ditching under §25.801 and ice protection under §25.1419. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as FAR Part 25 is the basic 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.

The certification basis of the 737-4/500 is very similar, with certification to FAR 25 including 25-15 plus various later paragraphs, except there were more equivalent safety findings granted. These have been reviewed and accepted by the CAA.

(ii) *Special Conditions:*

One Partial Exemption was granted to the 737-300:

Exemption No. 7968 – FAR §25.901(c) requires in part that “no single failure will jeopardise the safe operation of the airplane”. Recent studies have shown that existing transport category aircraft do not strictly comply for certain uncontrollable high thrust failure conditions. However for the 737 a FAA/JAA/Boeing joint committee found that for some existing aircraft with a high demonstrated level of reliability, mandating design changes could not be justified, provided Boeing showed it had taken all practicable actions to minimise the adverse effects on safety.

(iii) *Equivalent Level of Safety Findings:*

Seven equivalent safety findings were made against FAR 25 for the 737-300:

FAA Issue Paper A-1 FAR §25.723(a) Shock Absorption Tests – The 737-300 main landing gear was certified by analysis rather than drop test, on the grounds Boeing had demonstrated the reliability of the analysis on the 757 and 767 programs; there has been no adverse service experience with the existing 737 and sufficient margins exist to assured continued safety; and the +6.5% increase in Max. Landing Weight is conservatively viewed in the light of other programs.

FAA Issue Paper CI-1 FAR §25.25.791 Passenger Information Signs and Placards; FAR §25.853(c) Compartment Interiors – Hardwired ON lighted “No Smoking” signs were accepted as equivalent to placards. (When the entire cabin is not equipped with pax-seat ashtrays.)

FAA Letter ANM-120S: TWR FAR §25.803(c)(8) Emergency Evacuation – The FAA allowed a deviation from the sex/age distribution for the demonstration, which is now formalised in AC25.803-1. (At least 25% >50 with 40% female, of remainder 30% must be female)

FAA Issue Paper A-7 FAR §25.809(f)(1)(ii) Escape Slides – Under certain adverse airplane attitudes (low sill height) the aft escape slides may not automatically inflate. This was accepted because there is a manual inflation handle; the probability of passenger injury can be minimised by placards; and the low sill height would be less than 6 ft off the ground when no emergency descent assistance means is actually required under the regulations.

FAA Issue Paper A-5 FAR §25.811(e)(3) Emergency Handle Illumination – Instead of self-illumination to a minimum brightness level, the overwing exit handle is illuminated by the emergency lighting system. This is allowed for Type A and Type I exits. This was accepted because the measured light levels are over the minimum, visible over 30”, and not degraded by crowding.

FAA Issue Paper A-6 FAR §25.812(b)(1)(i) Emergency Exit Signs – The letters must have a specified stroke-width ratio. Boeing proposed letters that varied in order to produce a clear, distinct and uncrowded sign. This was accepted as meeting the intent of the regulation for legibility.

FAA Issue Paper P-5 FAR §25.1093(b)(1) Induction System De-icing and Anti-Icing Provisions – This requires turbine engines and inlet systems to function satisfactorily in certain ground and flight icing conditions. On the 737-300 the CFM installation provides protection to minimum idle speed when cowl TAI is selected on, and offers spinner ice shedding protection. In addition to N₁ annunciation the 37% power setting is in the FAA-Approved AFM limitations.

An additional twenty one Equivalent Safety Findings were made for the 737-400. Eighteen were related to Use of the 1-g Stall Speed Instead of Minimum Speed in the Stall as a Basis for Determining Compliance – See Issue Paper F-2

FAR 25.107 Takeoff Speeds – Issue paper F-1 – Boeing proposed using the 737-300 flight-test-determined VMU schedule for the stretched 737-400, even though it is geometry-limited to produce the same liftoff airspeed. The FAA accepted this general principle, as previous operational history of such aircraft has been satisfactory. However some additional abuse tests were specified to ensure tailstrike was not a problem.

FAR 25 Stall Speeds – Issue paper F-2 – Boeing elected to use 1-g stall speeds, rather than the “traditional” V_{MIN} as the reference data for the 737-400, as originally developed for the 767-300.

FAR 25.811(f) Exterior Exit Markings – Issue Paper C-1 – FAA Project Number TD2695SE-T (All Models) – The FAA accepted a reflective difference of 25%, instead of the required 30%, for the lower door sill as an exit band when other FAA requirements were exceeded, provided the sill width is less than 5 inches.

FAR 25.1415(d) ELT – Issue paper C-1 – FAA Project TD1990SE-T (All Models) – Installation of ELTs meeting TSO-C91a or TSO-C126 are accepted as equivalent to TSO-C91.

(iv) *Airworthiness Limitations:*
See the applicable maintenance manuals.

(v) *Exemptions:*
Nil

(3) Environmental Certification:

The 737-300 has been certificated against FAR Part 36 with Amendments 36-1 through 36-12, which was updated to Amendment 36-15 for the 737-400/500.

Noise Characteristics are specified in Section 4.2 of the Airplane Flight Manual.

(4) Certification Compliance Listing:

Summary List – Basic Certification Documentation to FAA 737-300 – Nov 1985

Boeing Document D6-17567 Appendix VIII, “Model 737-300 Stretch Fuselage and CFM56-3 Engine. FAA Project CT2648NW-D.”

Boeing advised there is no Compliance Checklist available for the 737-400. (See email from N G Turner dated 21 January 2006). The following Issue Papers were supplied:

Issue Paper A-1 – Pressure Loads in Normally Unpressurized Areas

Issue Paper G-1 Stage 2 – Designation of Applicable Regulations

Issue Paper G1 Stage 4 – Certification Basis (Rudder System Design Enhancement Program RSEP) Model 737-300/-400/-500

Issue paper G-2 – ESF Applicable to both the 737-300 and 737-400 (5 listed)

Issue Paper O-1 – Operational Acceptability

Issue Paper O-2 – Forward Observer’s Seat and Associated Systems

Issue paper S-1 – Integrated Approach Navigation (IAN) Program

Issue paper S-2 – Required Navigation Performance (RNP) Approval

(5) Flight Manual: FAA-Approved 737-3S3 Flight Manual – Document D6-8730.3Q83 (applicable to 3A4/3Q4/3Q8/3K2/3S3.) – CAA Approved as AIR 2446

FAA-Approved 737-3M8 Flight Manual – Document D6-8730-3M8
CAA Accepted as AIR 2578.

FAA-Approved 737-33R Flight Manual – Document D6-8730.33R
(applicable to s/n 28868, 28873) – CAA Accepted as AIR 2601

FAA-Approved 737-36Q Flight Manual – Document D6-8730-36Q2
(3 vols.) Issued 14 November 1984 – CAA Accepted as AIR 2614

FAA-Approved 737-3U3 Flight Manual – Document D6-8730-3U3
CAA Accepted as AIR 2653

FAA-Approved 737-319 Flight Manual – Document D6-8730-319
CAA Accepted as AIR 2673

FAA-Approved 737-33S Flight Manual - Document No. D6-8730.33S
(applicable to s/n 29072) – CAA Accepted as AIR 2718

FAA-Approved Boeing 737-33A Airplane Flight Manual – Document
D6-8730.33A5 (applicable s/n 25119) – CAA Accepted as AIR 2794

FAA-Approved 737-376 Flight Manual – Document D6-8730.377
(applicable s/n 24030, 24460, 27267) – CAA Accepted as AIR 2795

FAA-Approved 737-376 Flight Manual – Document D6-8730.376
CAA Accepted as AIR 2802

FAA-Approved 737-37Q Flight Manual – Document D6-8730.37Q2
(applicable to s/n 28548) – CAA Accepted as AIR 2803

FAA-Approved 737-31S Flight Manual – Document D6-8730.31S
CAA Accepted as AIR 2866

FAA-Approved 737-476 Flight Manual – Document D6-8734.476
CAA Accepted as AIR 2951

FAA-Approved 737-3B7 Flight Manual – Document D6-8730.3B7
CAA Accepted as AIR 3005

FAA-Approved 737-3Q4 Flight Manual – Document D6-8730.3Q83
CAA Accepted as AIR 3006

FAA-Approved 737-3S1 Flight Manual – Document D6-8730.3S1
CAA Accepted as AIR 3178

FAA-Approved 737-4Q8 Flight Manual – Document D6-8734.4Q84
CAA Accepted as AIR 3204

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

(6) Operating Data for Aircraft and Engine:

(i) *Maintenance Manual:*

Boeing 737-300 Maintenance Review Board Report – Document 737-MRB

737-300/400/500 Maintenance Review Board Report – D6-82981-MRBR

Boeing 737 Non-Destructive Testing Manual – Document D6-37329

737-300/400/500 Maintenance Planning Data – Document D6-38278

737-100/200/300/400/500 Certification Maintenance Requirements D6-38278-CMR

737-100/200/300/400/500 Repair assessment Guidelines – Document D6-38669

737-300/400/500 Maintenance Manual (ILF) – Document D6-37535

737-300/400/500 Maintenance Manual (AWW) – Document D6-37547

737-300/400/500 Maintenance Manual (BOU) – Document D6-39021

737-300/400/500 Maintenance Manual (ANZ) – Document D6-39041

Boeing 737-300 Configuration Maintenance Planning D6-38123

(ii) *Current service Information:*

See Boeing website

(iii) *Illustrated Parts Catalogue:*

737-300/400/500 Aircraft IPC (QAN) – Boeing Document D6-38550-QAN-0109

737-300/400/500 Aircraft IPC (ANZ) – Boeing Document D6-38550-ANZ-0224

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

CAA 2171 form from Robert Gibson, 737 AFM Editor, dated 9 January 1998.

CAA 2171 for 737-319 from BCAG Certification Specialist dated 10/8/99

Email(s) from Boeing Flight Operations Engineering dated 2 October 2002

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 for which access has been authorised. Boeing has provided access for all variants which are on the NZ Civil Aircraft Register.

(8) Other information:

ILFC Corporation Model 737-3S3 Detail Spec. – Document D6-76300-57
Boeing Letters of Definition B-7525-RD-87-165/592/610 – Model 737-3S3

ILFC Corporation Model 737-3Q8 Detail Spec. – Document D6-76300-69-2 Rev.H
Boeing Letters of Definition B-225R-91-2140 Interlease (ILF) PQ293 Oct 10, 1991

TEA 737-3M8 Detail Specification – Document D6-76300-59 – Revision J
Boeing Model 737-3M8 Operations Manual – Document D6-27370-3M8

GE Capital Aviation Services (GECAS) Detail Specification Model 737-33R
Doc. D6-38604-28-1 Original Release – December 22, 1997
(originally issued as Western Pacific DS D6-38604-28 Rev.A June 9, 1997)

Boullioun Aviation Services Inc. Detail Specification Model 737-36Q
Doc. D6-38604-26 – Aircraft PR009 added by Revision D - March 23, 1998

Garuda Indonesian Detail Specification Model 737-3U3 – Document D6-38604-29

Air New Zealand Detail Specification Model 737-319 – Document D6-38604-8

ILFC Model 737-3K2 Detail Specification – Doc. D6-76300-76-9 – Revision A

Customer Engineering B-S000 – Detail Specification Model 737-33S
Boeing Document D6-38604-33- at Revision B dated March 24, 1998

Nordstress Model 737-33A Detail Spec. – Document D6-76300-43-1 – Revision F
AWAS Model 737-33A Detail Spec. – Document D6-76300-43-2 – Revision V

Australian Airlines Model 737-376 Detail Spec. – Doc. D6-76300-16 – Revision N
Australian Airlines Engineering Report No. 270 Issue 4 – Australian Airworthiness Certification Boeing 737-376 as Operated by Australian Airlines – Date 22.08.89

Novel Leasing Ltd 737-37Q Detail Spec. – Document D6-38604-25 – Revision B

Deutsche BA Model 737-31S Detail Spec. – Document D6-38604-35 – Revision D

Qantas Airways Limited 737-476 Detail Spec. – Doc. D6-38900-13-1 – Revision 0
Boeing Letters of Definition B-225R-89-2704 and B-T02R-92-221: Model 737-476

Boeing Model 737-33R Operations Manual – Western Pacific Airlines (3 Vols.)
Boeing Document D6-27370-33R dated February 14, 1997 at Rev.5 Dec 05/97

737-36Q & 46Q Operations Manual – Boullioun Aviation Services Inc. (3 Vols.)
Boeing Document D6-27370-36QK dated December 6, 1996 at Rev.5 Feb 13/98

Boeing Model 737-3U3/4U3/5U3 Operations Manual – Doc. D6-27370-4U3-GIA

Boeing Model 737-319/3U3 Operations Manual – Doc. D6-27370-3U3Z-ANZ

Boeing 737-300 Quick reference Handbook

Electrical Load Analysis – 737-300 – Document D6-37804 Rev Sym A
(Supplemental) Electrical Load Analysis – WPA Model 737-33R (PR045)
(Supplemental) Electrical Load Analysis – BOU Model 737-36Q (PR009)

Electrical Load Analysis – Document D6-37907-1B – Model AUS 737-476

B/E Aerospace – Report 12564 – Flammability of Aircraft Seat Cushions for
Boeing/Western Pacific (original seats installed at delivery)

Air NZ Report ET890 – ANZ B737-300 Minor Avionic Modifications
Rpt. ET899 – ZK-NGA, B, C Compliance with Part 26 Appendix D.4(b)(2)
Air NZ Report ET910 – Compliance with Mandatory Fireblocking Requirements –
ZK-NGA Interim Configuration
Air NZ Report ET912 (Extracts) – Compliance with Mandatory Fireblocking
Requirements – ZK-NGB Interim Configuration

Boeing SB 737-71-1233 – Intermix of One CFM56-3B-2 with a CFM56-3C-1
Engine or Substitution of Two CFM56-3B-2 for CFM56-3C-1 Engines or Change
to Operate Two CFM56-3C-1 Engines at 20,000 Pounds Thrust Level.

ANZ Report ET889 Rev.3 – Air New Zealand B737-300 ETOPS CMP Compliance

Configuration, Maintenance and Procedures for Extended range (ER) Operation –
Model 737-300/-400/-500 – Boeing Document D6-38123

USAir Detail Specification Model 737-3B7 – Document D6-76300-1 Revision S
Boeing Letter of Definition B-7325-RD-5412: 20x follow-on Model 737-3B7

ILFC Detail Specification Model 737-3Q4 – Document D6-76300-30 Revision B
Boeing Letters of Definition B-225R-87-1720/1810: 3x First-of-Model 737-3Q4

CAA AAN No. 20582 Addendum 2 – B737-33A G-OBMC and D

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.

CAR 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 §25.811(a) Amdt 25-32 Eff Feb 24, 1972
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

Appendix C – Air Transport Aircraft – More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	FAR Part 25 §25.809(b) Amdt 25-32 Eff Feb 24, 1972
C.2.1	Additional Emergency Exits – certification requirements	Meets FAR Part 25 Certification requirements
C.2.2	Emergency Exit Evacuation Equipment – Descent means	FAR Part 25 §25.809(f) Amdt 25-32 Eff Feb 24, 1972
C.2.3	Emergency Exit Interior Marking – Size/self-illuminating	FAR Part 25 §25.811(e), Amdt 25-32 Eff Feb 24, 1972 FAR Part 25 §25.812(b) Amdt 25-51 Eff Mar 6, 1980
C.3.1	Landing Gear Aural Warning - Automatic Flap Linking	FAR Part 25 §25.729(e) Amdt 25-23 Eff May 8, 1970 <i>See Detailed Specification §31-51-10 & §32-60-00</i>

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	FAR Part 25 §25.807(g) Amdt 25-15 Eff Oct 24, 1967
D.1.2	Floor Level Exits – Definition	FAR Part 25 §25.807(a) Amdt 25-15 Eff Oct 24, 1967
D.2.1	Additional Emergency Exits - Must meet requirements	Type A and III exits only which meet FAR 25 requirements
D.2.2	Emergency Exit Access - Required Exits have: Passageway unobstructed 500mm wide leading to 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 §25.813 Amdt 25-17 Eff Jun 20, 1968 <i>See Boeing Detailed Spec. (BDS) D6-76300-43-2 Figure 01-11 Interior Arrangement for original configuration AWAS interior - LOPA Ansett Australia Dwg. B73-2520112</i>
D.2.3	Emergency Exit Operating Handles - Markings/Lighting	FAR Part 25 §25.811(e) Amdt 25-32 Eff Feb 24, 1972 NOTE: in respect of Emergency Handle Illumination, there was an FAA equivalent safety finding for §25.811(e)(3).
D.2.4	Emergency Exit Evacuation Equipment – Descent means	FAR Part 25 §25.810 Amdt 25-15 Eff Oct 24, 1967
D.2.5	Emergency Exit Escape Route - Must be slip resistant	FAR Part 25 §25.803(e) Amdt 25-51 Eff Mar 6, 1980
D.2.6	Emergency Lightning (a) Switch Provisions; Uninterrupted Power; Last 10 min. (b) Descent Illumination - Automatic and Independent	FAR Part 25 §25.812(f) Amdt 25-51 Eff Mar 6, 1980 FAR Part 25 §25.812(h) Amdt 25-51 Eff Mar 6, 1980
D.2.7	Emergency Interior Lighting – independent supply; min. illumination; incl. floor proximity escape path markings	FAR Part 25 §25.812(c) & (e) Amdt 25-51 Eff Mar 6, 1980 <i>Refer Boeing Detailed Specification §33-51-00</i>
D.2.8	Emergency Exterior Lighting – In effect 30.04.72 or later	FAR Part 25 §25.812(f) & (g) Amdt 25-51 Eff Mar 6, 1980 <i>Refer Boeing Detailed Specification §33-51-00</i>
D.2.9	Emergency Exit Interior Marking – Clear; instructions; Location signs above routes, by exits, on bulkheads Minimum brightness 250 microlamberts	FAR Part 25 §25.811 Amdt 25-32 Eff Feb 24, 1972 Meets FAR Part 25 certification requirements
D.2.10	Emergency Exit Exterior Markings – 2” contrasting band; opening instructions in red or bright chrome yellow;	FAR Part 25 §25.811(f) Amdt 25-32 Eff Feb 24, 1972 NOTE: There was an FAA ESF for §25.811(f).
D.3	Lavatory Fire Protection – Placards; Exterior ashtray; Waste Bin - Sealed door; built-in fire extinguisher; smoke detector system with external warning	AD DCA/GEN/7A (FAA AD 74-08-09R2); DCA/GEN/16 FAR Part 25 §25.791(d) Amdt 51 Eff Mar 6, 1980 <i>See Detailed Spec. §25-41-00; §26-24-00; §26-31-00</i> NOTE: For Pax Information Signs & Placards, §25.791 is the subject of an FAA equivalent safety finding for the 737-300
D.4	Materials for Compartment Interiors – T/C after 1.01.58: (b) Manufactured 20/8/88 - 20/8/90 – Meet heat release requirements of FAR 25 at 20.08.86 increased to 100/100 Manufactured after 20/8/90 – Meet FAR 25 in effect 26.09.88 (c) Seat cushions (except flightdeck) must be fireblocked NOTE: In respect of Compartment Interiors, §25.853(c) is the subject of an FAA equivalent safety finding.	DCA/GEN/15 [FAR 25 §25.853(c) Amdt 59 Eff 26/11/84]; DCA/GEN/21 [FAR §121.312(a) @ 121-198 Eff 26/9/88] <i>See Boeing Detailed Specification §25-00-00</i> Seat cushions meet the requirements of TSO C39B and FASR 25.853(c) – <i>See Boeing Letter B-T113-98-0136</i>
D.5	Cargo/Baggage Compartments – TC 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; and (c) Liners shall be separate from the aircraft structure	AD DCA/GEN/22 [FAR §25.855 Amdt 25-32 Eff May 1, 1972 & Part §121.314 Amdt 121-202 Eff Mar 20, 1989] - The compartments contain aluminium in addition to materials specified in D.5(a)(1) and (2), and are designed to meet the intent of FAR Part 121.314 - <i>See Boeing letter Reference B-T113-98-0136 dated 8/1/98.</i>
Notes:	1. Class D cargo compartments can be upgraded to Class C compartments per FAR 121.314 by carrying out BSB737-26A1082 R02 in conjunction with Master Change 2623MK3014 (2 nd fire bottle for ETOPS operations.)	

NOTE: Detailed Specification references in the tables were taken from D6-38604-28-1.

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

Civil Aviation Rules Part 91

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	FAR Part 25 §25.785 Amdt 20 Eff March 18, 1969
91.507	Pax Information Signs – Smoking, safety belts fastened	FAR Part 25 §25.791 Amdt 25-51 Eff Mar 6, 1980 <i>See Boeing Detailed Specification §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)/§34-13-01 <i>See Detailed Spec. §34-13-01</i> FAR 25.1303(b)(2)/§34-13-02 FAR 25.1303(a)(3)/§34-23-02 FAR 25.1305(a)(2)/§28-41-00 FAR 25.1305(c)(3)/§77.00.00 FAR 25.1305(a)(4)/§77.00.00
91.511 Night	(1) Turn and Slip (2) Position Lights	FAR 25.1303(b)(4) EFIS fitted FAR 25.1389/§33-43-00
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	<i>EFIS Detailed Spec. §34-21-10</i> FAR 25.1303(b)(6)/§34-21-20 FAR 25.1331(a) FAR 25.1303(b)(2)/§34-13-02
91.519	IFR Communication and Navigation Equipment * 2 nd HF in ZK-JNE removed by TransBrasil EO 737-23-111 16/4/99	FAR Part 25 §25.1307 Amdt 25-51 Eff Mar 6, 1980 Dual Collins HFS-700 and VHF-700 fitted as standard – <i>See BDS §23-11-00 and §23-12-00 – in accordance with Boeing Change Requests 23-006 and 23-008</i> Dual Rockwell 51RV-4B VOR/ILS fitted as standard – <i>See BDS §34-31-00 and §34-51-00</i> Single Rockwell 51Z-4 Marker Beacon fitted as standard – <i>See BDS §34-32-00</i> Dual Rockwell 51Y-7 ADF/DME fitted as standard – <i>See BDS §34-55-00 and §34-57-00</i>
91.523 Emgcy Eqpmt.	(a) More Than 10 pax – First Aid Kits per Table 7 (2 required for >100 pax capacity) – Fire Extinguishers per Table 8 (b) More than 20 pax – Axe readily acceptable to crew (c) More than 61 pax – Portable Megaphones per Table 9	<i>See Boeing Detailed Spec. D6-76300-xx Section. §25-64-10</i> – First Aid Kit standardised per Air NZ EO 737-2560-00024 <i>See Boeing Detailed Spec. §26-26-00 (BCF and water)</i> <i>See Boeing Detailed Spec. D6-76300-xx Section. §25-64-40</i> NOTE: Cockpit axe not fitted in Australian airline service <i>See Boeing Detailed Spec. D6-76300-43 Section. §25-64-20</i> NOTE: Not fitted as standard on 737-376 aircraft
91.529	Emergency Locator Transmitter – Must meet TSO C91a or TSO C126 (if installed after 1/4/97 or the original becomes unserviceable)	Not fitted as standard Exemptions 3/EXE/20, 23,24,25 and 29 granted as an interim measure to give Jetconnect time to install permanent ELTs.
91.531	Oxygen Indicators - Volume/Pressure/Delivery	FAR Part 25 §25.1441 through 25.1450
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 1201 (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% – Extra Units Uniformly Distributed – Automatically Presented Above FL140 – Manual Means of Deploying Pax Masks	Standard system capacity 39 ft ³ up to s/n 25508, and 76 ft ³ for subsequent – <i>See Detailed Spec. D6-76300-xx §35-10-00</i> ; Additional oxygen bottles to be fitted in accordance with Air New Zealand EO 737-2560-00042 (Brings configuration to the same as Air New Zealand Boeing 737-300 aircraft, which have been previously accepted as meeting Part 91 oxygen requirements.) See ANZ Dwg 4003549 Emergency Equipment Layout JNE See ANZ Dwg 4003448 Emergency Equipment Layout CZR [Maximum Operating Altitude is 37,000 feet.] The standard 737-300 crew oxygen system is designed to meet FAR 121.333. The passenger and flight attendant oxygen system is supplied from chemical oxygen generators.
91.541	SSR Transponder and Altitude Reporting Equipment	Dual ATC Transponder fitted as standard – <i>see BDS BFE</i>
91.543	Altitude Alerting Device - Turbojet or Turbofan	<i>See Boeing Detailed Spec. D6-76300-xx §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

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.

Civil Aviation Rules Part 121

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
121.355	Additional Instruments (Powerplant and propeller)	FAR Part 25 is a Part 21 Appendix C standard
121.357	Additional Eqpt – Windscreen Wiper, Door, Key, Placard	See Detailed Specification §30-43-00 and §25-18-00
121.359	Night Flight – Landing Light, Light in each pax cabin	See Detailed Specification §33-42-10 and 33-21-00
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	TSO C99 cockpit equipment TSO C116 cabin equipment
	NOTE: Portable cockpit pbe is not required in Australian airline service. A set of TSO C116 equipment was fitted for compliance with DCA/GEN/17A in accordance with Air New Zealand Engineering Order EO 737-2560-00041	
121.369	Pax Address, Intercom AD DCA/GEN/24	FAR §121.318 Amdt 121-209 & §121.319 Amdt 121-178
	NOTE: The Cabin Interphone system on the 737 was designed to meet FAR 121.319 and was demonstrated on the first airplane with a certification flight test. The PA system was designed to meet 121.318 and was similarly demonstrated. – See Boeing Letter B-T113-98-0136 dated January 08, 1998.	
121.371	Cockpit Voice Recorder – Appendix B.5 requires TSO C84/C123 – (BDS Specifies ARINC 557)	See Detailed Spec. §23-70-00 and Appendix IIA (BFE) Chapter 23 – Fairchild A100A/S with ULB fitted as standard
121.373	Flight Data Recorder Appx. B.6 TSO C124	-33A – See BDS D6-76300-43 §31-31-00 – Fairchild DFDR to ARINC 747 with ULB - records 17 specified airplane parameters up to s/n 24790, then 42 mandatory parameters for later s/n -376 – See BDS D6-76300-16 §31-31-00 – Lockheed 209F DFDR to ARINC 573 with ULB – records 21 specified parameters required by Australian D.O.T.C. and ANO 103.19
121.375	Additional Attitude Indicator	See Boeing Detailed Specification §34-23-01
121.377	Weather Radar Appendix B.8 requires TSO C63	See Boeing Detailed Spec. D6-76300-xx §34-43-00 (BFE) Rockwell WRT-701X meets ARINC 708
121.379	Ground Proximity Warning System Appendix B.9 requires TSO C92 (AD DCA/GEN/13A)	Sundstrand Mk.V (Allied Signal S220T102 after serial no. 24789) to ARINC 594 or ARINC 723 - See Boeing Detailed Specification §34-46-00 and Appendix IIA (SPE)

Certification Issues

During the type acceptance investigation and aircraft inspection the following issues arose related to the 737-300 interior configuration adopted by Air New Zealand:

Liferaft Location

Air New Zealand located two of the three liferafts in lockers located in the bulkhead fitted between the business and economy class cabins. This does not comply with the FAR §25.1411(d)(2) requirement that life rafts be stowed near exits through which the rafts can be launched during an unplanned ditching. The FAA confirmed they would require the 737-300 with three rafts to have one near the forward exits, one near the overwing exits and one near the aft exits.

Air NZ stated the location was based on the proposition that the rear exit would be underwater during a ditching. However the FAA advised that the 737-300 is one of the models of Boeing 737 in which the rear exit is above water in a ditching situation. In addition a fax from Boeing indicated that the 737-300 floats in the water at a slight angle but with the rear door sill height 2 inches above the water line. The CAA view was that with the majority of the passengers seated aft of the emergency overwing exits the aft exits should be used in a ditching situation unless there was a very good reason not to. Air NZ was required to re-position one liferaft near the rear doors, and to review their emergency procedures, manuals and training to be consistent with this liferaft position.

Overwing Exit Line

The first aircraft was delivered without an overwing exit assist line. This is required equipment under FAR §25.1411(g) and must be fitted.

Exit Row Clearance

The outboard seat on the overwing exit row extended four inches into the projected area of the exit, apparently in contradiction of the requirements of FAR §25.813(c)(1). However the FAA confirmed that the seats may intrude up to four inches based on the Type III exit opening being oversize plus allowing for two inches cushion compression.

Exit Row Seat Recline

During the post delivery inspection of aircraft S/N 25606 (ZK-NGG) on 27 October 1999 at Christchurch for the purpose of issuing a non-terminating Airworthiness Certificate, it was noted that the seat backs of seats immediately forward of the over-wing exits (Row 10) were fully reclinable. Of particular concern was the intrusion, when fully reclined, of each out-board seat back at Row 10 into the space adjacent to the corresponding over-wing exit, a zone required to be unobstructed at all times.

A similar finding had been made in the course of an inspection of Boeing 737-36Q aircraft S/N 29189 (ZK-NGC) carried out in September 1998. In that case, the seats in question were at Row 8.

As noted elsewhere in this report, ZK-NGG was delivered from Boeing without passenger seats installed. For this reason, of course, the question of whether or not the aircraft was compliant with the applicable airworthiness design requirement covering the clearance of over-wing exits did not arise as far as the FAA were concerned. Air New Zealand was reminded of the design requirement covering Type III emergency exit access in CAA letter dated 18 Nov, 1999. A copy of this letter was placed on the aircraft file for ZK-NGG.

Attachments

The following documents form attachments to this report:

- Three-view drawings Boeing Models 737-300 and 737-400
- Copy of FAA Type Certificate/ Type Certificate Data Sheet 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>
737-3S3	AC 21-1.2/NZCAR Part 21 Appendix A(c)		11 May 1992
737-3Q8	AC 21-1.2/NZCAR Part 21 Appendix A(c)		4 September 1992
737-3M8	South Pacific Air Charters Limited	97/21B/12	19 February 1997
737-33R/36Q	Air New Zealand Limited	98/21B/9	9 January 1998
737-3U3	Air New Zealand Limited	99/21B/30	1 April 1999
737-319	Air New Zealand Limited	0/21B/3	15 October 1999
737-33R	Air New Zealand Limited	0/21B/20	20 June 2000
737-3K2	Air New Zealand Limited	1/21B/8	15 December 2000
737-33S	Air New Zealand Limited	1/21B/12	10 May 2001
737-33A/376	Jetconnect Limited	3/21B/6	16 October 2002
737-37Q	Air New Zealand Limited	3/21B/9	29 October 2002
737-31S	Freedom Air Limited	4/21B/26	14 May 2004
737-476	Jetconnect Limited	6/21B/8	2 June 2006
737-3B7/3Q4	Airwork Flight Operations Limited	7/21B/34	20 April 2007
737-3S1	Airwork Flight Operations Limited	11/21B/23	29 April 2011
737-4Q8	Airwork Flight Operations Limited	12/21HA/107	27 January 2012

NOTE: Subject to access to the serial-number specific operating documentation on the myboeingfleet.com website, CAA has granted Type Acceptance to all Boeing 737-300 and 737-400 variants which comply with the type certification basis stated on the TCDS and referenced in this report.