



OPERATIONAL EVALUATION REPORT

THE BOEING COMPANY

BOEING 787

ORIGINAL – MAY 11, 2021

Boeing 787 Team Composition

ANAC

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BOEING 787

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Revision Record

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Acronyms

AC	Advisory Circular (FAA)
AFDS	Autopilot Flight Director System
ANAC	<i>Agência Nacional de Aviação Civil</i> , Brazilian Civil Aviation Authority
ANSP	Air Navigation Service Provider
AIC	Aeronautic Information Circular
CBT	Computer Based Training
DECEA	<i>Departamento de Controle do Espaço Aéreo</i> , Brazilian ANSP
ECL	Electronic Checklist
EFB	Electronic Flight Bag
EFIS	Electronic Flight Instrument System
EGPWS	Enhanced Ground Proximity Warning System
EICAS	Engine Indicating and Crew Alerting System
FAA	Federal Aviation Administration
FD	Flight Director
FFS	Full Flight Simulator
FMS	Flight Management System
FSB	Flight Standardization Board
FSTD	Flight Simulation Training Device
GE	General Electric
GLS	GBAS Landing System
GPS	Global Positioning System
HUD	Head-Up Display
IAN	Integrated Approach Navigation
ILS	Instrument Landing System
IS	<i>Instrução Suplementar</i> , ANAC Supplementary Instruction
MDR	Master Differences Requirements
ND	Navigation Display
ODR	Operator Differences Requirements
PC	Proficiency Checks
PFD	Primary Flight Display
PIC	Pilot In Command
QRH	Quick Reference Handbook
RBAC	<i>Regulamento Brasileiro de Aviação Civil</i> , Brazilian civil aviation regulations
RR	Rolls-Royce
STAR	Shortened Type Rating
TASE	Training Areas of Special Emphasis

TCDS Type Certification Data Sheet
TCP Tuning Control Panel
VREF Landing Reference Speed

1. INTRODUCTION

1.1. Background

During April 2021 an operational evaluation was conducted by ANAC Aircraft Evaluation Group in Miami, FL - USA, where the proposed Shortened Type Rating (STAR) training for the 787-9 was evaluated. Type rating determination for models 787-8 and 787-10 was made through analysis. These evaluations were conducted using the methods described in ANAC IS 00-007A.

The results presented in this report for subject/areas that were not the scope of ANAC evaluations are based on the Boeing 787 FAA FSB Report revision 7, dated 08 May 2019.

1.2. Objective

The objective of this report is to present the results from the operational evaluation of the Boeing 787 series aircraft.

The content of this report is applicable to operations under the framework of ANAC.

1.3. Purpose

The purpose of this report is to:

- Determine the Pilot Type Rating assigned for the Boeing 787 series;
- Recommend the requirements for training, checking and currency applicable to flight crew for the Boeing 787 series, and functionalities; and
- Determine operational suitability of Boeing 787 series.

1.4. Applicability

This report is applicable to:

- ANAC employees who approve training programs;
- ANAC employees and designees who certify airmen; and
- Aircraft operators and training providers certified/ approved under Brazilian requirements to assist them in developing their flightcrew member training, checking, and currency.

1.5. Cancellation

Not Applicable.

2. PILOT TYPE RATING

Boeing 787 type rating designation is “B777/787”.

Table 1 – ANAC IS 61-004 (type rating list) revision proposal

Fabricante (Manufacturer)	Aeronave (Aircraft)		Observações (Remarks)	Designativo (Designative)
	Modelo (Model)	Nome (Name)		
BOEING COMPANY, THE	777-200/300ER	Boeing 777	Relatório de Avaliação Operacional Boeing 787	B777/787
	787-8/9/10 series	Boeing 787	ANAC Operational Evaluation Report Boeing 787	

3. RELATED AIRCRAFT

3.1. Related aircraft on same TCDS:

- The B-787-8 has been evaluated by the ANAC as related to the B-787-9 and the B-787-10.
- The B-787-9 has been evaluated by the ANAC as related to the B-787-8 and B-787-10.
- The B-787-10 has been evaluated by the ANAC as related to the B-787-8 and B-787-9.

3.2. Related Aircraft on Different TCDS. The Boeing 787 is related to the Boeing 777:

- The B-787 has been evaluated by the FAA as related to the B-777.
- The B-777 has been evaluated by the FAA as related to the B-787.

Note: Operational communality between Boeing 777 and Boeing 787 was not the scope of ANAC operational evaluation of April 2021. This information was provided by the FAA and accepted by ANAC.

4. SPECIFICATIONS FOR PILOT TRAINING

4.1. Airman Experience

Airmen receiving initial Boeing 787 training should have previous operational experience in multiengine transport turbojet aircraft, new generation avionics, high altitude operations, Head-Up Display (HUD), electronic checklist (ECL), and flight management systems (FMS). Pilots without this experience may require additional training.

Airmen receiving differences, upgrade, or transition Boeing 787 training are assumed to have previous experience in multiengine transport turbojet aircraft, new generation avionics, high altitude operations, HUD, ECL, and FMS. Pilots without this experience may require additional training.

4.2. Training Areas of Special Emphasis (TASE)

Pilots must receive special emphasis on the following areas during initial ground training:

- ECL. Paper quick reference handbook (QRH) backup for the ECL should also be trained.
- Electronic Flight Bag (EFB). Refer to the current version of the Boeing Class 3 EFB FSB report.
- HUD, if option is installed.
- Tuning control panel (TCP).
- Integrated Approach Navigation (IAN) for non-ILS/GLS approaches.
- Display management.
- Engine variants (General Electric (GE) or Rolls-Royce (RR)) if in the same fleet. Pilots should be exposed to the alternate engine indicating and crew alerting system (EICAS) presentations by means of photos, drawings, or graphic media which would assure proper display interpretation and use by the flight deck crew.

Pilots must receive special emphasis on and perform the following areas during flight training:

- Flight control modes. Pilots should be familiar with handling qualities in Secondary and Direct Flight Control Modes. This item must be included in initial and recurrent training.
- Air data system. Pilots should be familiar with the architecture, redundancy and non-normal conditions of the air data system. Emphasis should be placed on pilot's control of the aircraft when transitioning from automatic flight to manual flight in response to an air data system malfunction that causes a degradation of flight control modes. This item to be included in initial training and recurrent training.
- Autopilot Flight Director System (AFDS). Pilots should be trained in timely intervention strategies, including alternate automation mode selection or manual intervention if the AFDS controlled flight path or autothrottle behavior is not as intended. This item to be included in initial and recurrent training.
- Envelope protection. Aircraft response to bank angle indications and protection, thrust asymmetry protection, enhanced underspeed (stall), and overspeed protection. This item to be included in initial training. Due to the extreme improbability of this

combination, engine failure training should not be conducted in secondary or direct flight control modes.

- Fly-by-wire speed stability characteristics and aircraft trimming. This item to be included in initial training.
- Automatic landings. Applicable if an operator conducts automatic landings in the Boeing 787. This should include a manually flown go around after an automatic autopilot disconnect on approach with both engines operating. This item to be included in initial training and recurrent training.

4.3. Seat Dependent Tasks

There are no seat dependent tasks.

4.4. Flight Simulation Training Devices (FSTD)

There are no specific systems, procedures, or maneuvers that are unique to the Boeing 787 that require a specific FSTD for training.

4.5. Training Equipment

There are no specific systems or procedures that are unique to the Boeing 787 that require specific training equipment.

4.6. Differences Training between Related Aircraft

Pilots must receive differences training between the 787-8, 787-9, and 787-10.

Pilots must receive differences training between the Boeing 787 and Boeing 777.

The levels for differences training are specified in Appendix 1.

4.7. Training Footprints

Examples of training footprints are present in Appendices 3 to 5.

5. SPECIFICATIONS FOR CHECKING

5.1. Landing from a No Flap or Non-Standard Flap Approach

The probability of flap extension failure on the Boeing 787 is extremely remote due to system design. Therefore, demonstration of a no flap approach and landing is not required. However, a partial flap approach and landing during pilot certification or a proficiency check is required.

5.2. Seat Dependent Tasks

There are no seat dependent tasks.

5.3. Other Checking Items

- Proficiency with manual and automatic flight. Initial and recurrent checking.
- FMS operation. Initial and recurrent checking.
- Use and knowledge of map displays, raw data, flight director (FD), and Autopilot Flight Director System (AFDS) should be demonstrated, particularly during instrument approaches. All types of checking.
- FMS/Global Positioning System (GPS) navigation (departures and approaches) proficiency if these type operations are approved for the operator. Initial and recurrent checking.
- ECL during normal and non-normal procedures. All types of checking.
- Proper management of speed and attitude stability functionality of flight controls in normal operations. Initial and recurrent checking.
- Proper use and knowledge of the look-ahead terrain function of the enhanced ground proximity warning system (EGPWS) (if installed). Initial and recurrent checking.
- Proper use and knowledge of the predictive wind shear system (if installed). All types of checking.
- Proper use of the HUD (if installed) to include all phases of flight. All types of checking.
- Proper use of the EFB. Initial and recurrent checking.

5.4. Flight Simulation Training Devices (FSTD)

There are no specific systems, procedures, or maneuvers that are unique to the Boeing 787 that require a specific FSTD for checking.

5.5. Training Equipment

There are no specific systems or procedures that are unique to the Boeing 787 that require specific equipment.

5.6. Differences Checking between Related Aircraft.

There is no differences checking required between the 787-8, 787-9, and the 787-10.

Pilots must receive difference checking between the Boeing 787 and Boeing 777. The level of checking is specified in Appendix 1.

Alternating Boeing 777 and Boeing 787 Proficiency Checks (PC). For mixed fleet flying between Boeing 777 and Boeing 787 aircraft, PCs should alternate for pilots in command (PIC) and other flightcrew members. The preflight and equipment examination portion of initial and recurrent PCs should address each aircraft operated by the flightcrew member in mixed fleet flying.

6. SPECIFICATIONS FOR CURRENCY

There are no additional currency requirements for the Boeing 787 other than those already specified in RBACs 61 and 121.

6.1. Differences Currency between Related Aircraft.

There are no differences currency requirements between the 787-8, 787-9, and the 787-10.

There are no differences currency requirements for RBAC 121 mixed fleet flying of the Boeing 787 aircraft and Boeing 777 aircraft. Takeoff and landing credit may be permitted between Boeing 787 and Boeing 777 variations. Takeoffs and landings performed in one aircraft variation are equivalent to those performed in the other aircraft variation.

7. OPERATIONAL SUITABILITY

The Boeing 787 is operationally suitable for operations under RBACs 91 and 121. Determination of operational compliance was made by conducting an evaluation of a 787-8, 787-9, and 787-10 aircraft.

8. MISCELLANEOUS

8.1. Forward Observer Seat

Forward observer seat was not scope of ANAC operational evaluation of April 2021.

The FAA determined the Boeing 787 center forward and right forward observer seats meet requirements of Title 14 of the Code of Federal Regulations (USA) §§ 121.581(a), 125.317(b), and 135.75(b) and the current edition of the FAA AC 120-83, Flight Deck Observer Seat and Associated Equipment. The forward center observer seat is identified as the primary forward observer seat.

8.2. Aircraft Approach Category

All operators should comply with DECEA publication AIC N07/09 dated 12 Mar 2009 and use an approach category appropriate to the speed of VREF. Air carriers may be further restricted by their operations specifications for circling approaches.

Approach Category for Boeing 787 series aircraft is as follows:

- The base 787-8 is considered Category C aircraft for the purposes of determining “straight-in landing weather minima.”
- The base 787-9 is considered Category C aircraft for the purposes of determining “straight-in landing weather minima.”
- The base 787-10 is considered Category D aircraft for the purposes of determining “straight-in landing weather minima.”
- The 787-8 and 787-9 both have optional configurations and performance packages available that would increase the “straight-in landing weather minima” to Category D. It is the operator’s responsibility to determine what category their specific aircraft is.

8.3. Emergency Evacuation

A full-scale emergency evacuation was successfully completed on the B-787 by Boeing. The demonstration complied with paragraph 121.291(a) of RBAC 121.

8.4. Normal Landing Flaps

The Boeing 787 (all variations) normal “final landing flap setting” are flaps 25 and flaps 30.

8.5. Aircraft Proving Tests

Proving tests in accordance with paragraph 121.163 of RBAC 121 are appropriate when the Boeing 787 is new to an operator.

8.6. Flightcrew Rest Facilities/Flightcrew Sleeping Quarters

Flightcrew rest facilities/ sleeping quarters were not scope of ANAC operational evaluation of April 2021. The FAA evaluated and determined that the Boeing 787 overhead flightcrew rest meet

requirements of 14 Code of Federal Regulations (USA) Parts 117 and 121 through the current editions of the FAA AC 117-1, Flightcrew Member Rest Facilities, and AC 121-31, Flightcrew Sleeping Quarters and Rest Facilities, respectively.

Appendix 1 – MASTER DIFFERENCE REQUIREMENTS (MDR) TABLE

These are the minimum levels of training, checking and currency required, derived from the highest level in the Operator Difference Requirements (ODR) tables in Appendix 2. Differences levels are arranged as training/checking/currency as per ANAC IS 00-007:

Boeing 787 variants MDR table

Base Aircraft →	787-8	787-9	787-10
Related aircraft ↓			
787-8	Not applicable	A/A/A	A/A/A
787-9	A/A/A	Not applicable	A/A/A
787-10	A/A/A	A/A/A	Not applicable

Notes:

(1) Training differences level D if Base Aircraft has option of HUD removed and Related Aircraft has HUD fitted.

Boeing 787 x Boeing 777 MDR table

Base Aircraft →	787	777
Related aircraft ↓		
787	Not applicable	D/D/*
777	D/D/*	Not applicable

(*) Difference levels for currency were not evaluated

Differences levels legend:

Level A differences training can adequately be addressed through self-instruction with the use of such methods as issuance of operating manual page revisions, dissemination of operating bulletins, or differences handouts.

Level D differences training is accomplished using devices that are capable of performing flight maneuvers and addressing full task differences of knowledge, skills, and/or abilities.

Level A differences checking indicates that no check is required at the time of training.

Level D differences checking requires a partial proficiency check using a maneuver device suitable for meeting level D (or higher) differences training requirements.

Level A differences currency is common to each aircraft and does not require separate tracking.

Appendix 2 – OPERATOR DIFFERENCE REQUIREMENTS (ODR) TABLES

This Design Differences table, from the Boeing 777-300ER to the Boeing 787-8, was proposed by The Boeing Company and validated by the FAA, with subsequent acceptance by ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 777-300ER	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
TO RELATED AIRCRAFT: 787-8	Dimensions		No	No	A	A	*
	Limitations	Weight/CG Speeds	No	Yes	A	A	*
	ATA 21 Air Conditioning	Controls and indicators Packs (electric CACs) Alternate ventilation system Equipment cooling system Cargo heat/AC systems	No	Yes	B	B	*
	ATA 22 Autoflight	Mode control panels AFDS Flight Mode Annunciations Approach and landing (IAN) Autothrottle logic and inhibits	No	Yes	B	B	*
	ATA 23 Communications	Controls and indicators VHF, HF, PA, cabin, flight, and service interphone SATCOM Audio control panels Tuning and control panels	No	Yes	B	B	*
	ATA 24 Electrical Power	Controls and indicators AC generation and distribution DC generation and distribution Battery and standby systems Autoland	No	Yes	B	B	*
	ATA 25 Equipment/Furnishings	Flight deck general arrangement Emergency evacuation panel	No	Yes	A	A	*
	ATA 26 Fire Protection	APU fire controls and indicators Cargo fire controls and indicators	No	Yes	A	A	*
	ATA 27 Flight Controls	Flight control systems Integrated Roll/Yaw Control Flight envelope protection Stabilizer trim Thrust asymmetry compensation (ITAC) Thrust Asymmetry Protection (TAP) Thrust Asymmetry Minimum Speed (TAMS) Flap load relief Alternate flap operation Cruise flaps system Vertical and lateral modal suppression	No	Yes	A	A	*

FROM BASE AIRCRAFT: 777-300ER TO RELATED AIRCRAFT: 787-8	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	ATA 28 Fuel	Controls and indicators Fuel tanks Fuel pumps Fuel balance system	No	Yes	B	B	*
	ATA 29 Hydraulic Power	Controls and indicators Hydraulic systems	No	Yes	A	A	*
	ATA 30 Ice and Rain Protection	Controls and indicators Windshield washer Wing anti-ice	No	Yes	A	A	*
	ATA 31 Indicating/Recording Systems	EFIS control panel PFD/ND controls Display select panels Instrument source selectors Cursor control Display formats Standby flight instruments	No	Yes	C	C	*
	ATA 31 Indicating/Recording Systems	Head-Up Display (HUD): • Dual installation (optional)	No	Yes	D	D	*
	ATA 32 Landing Gear	Main gear Nose wheel steering tiller Brakes	No	Yes	A	A	*
	ATA 34 Navigation	Control display unit Flight management system Inertial reference system Transponder panel Weather radar panel	No	Yes	B	B	*
	ATA 36 Pneumatic	Controls and indicators Engine anti-ice only	No	No	A	A	*
	ATA 49 Airborne Auxiliary Power	System operation	No	No	A	A	*
	ATA 52 Doors	No overwing slide	No	No	A	A	*
	ATA 70 Powerplant		No	Yes	A	A	*
	ATA 73 Engine Fuel and Control	EEC	No	No	A	A	*
	ATA 77 Engine Indicating	Controls and indications	No	Yes	B	B	*
	ATA 80 Starting	Controls and indications	No	Yes	B	B	*

(*) Not evaluated by ANAC

This Maneuver Differences table, from the Boeing 777-300ER to the Boeing 787-8, was proposed by The Boeing Company and validated by the FAA, with subsequent acceptance by ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 777-300ER TO RELATED AIRCRAFT: 787-8	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Exterior Preflight	Minor differences	No	No	A	A	*
	Preflight Procedures	Minor differences due to systems	No	Yes	B	B	*
	Before Start Procedures	Minor differences	No	Yes	B	B	*
	Taxi	Minor differences (Airport map on EFB)	No	Yes	B	B	*
	Engine Failure/V1	Minor differences (TAC off)	No	Yes	D	D	*
	Go-Around (All Engines)	Minor differences (TOGA to LNAV optional)	No	Yes	B	B	*
	ILS Engine Inoperative	Minor differences (TAC off)	No	No	D	D	*
	Go-Around	Minor differences (TAC off)	No	No	D	D	*
	Manual Landing (One Engine)	Minor differences (TAC off)	No	No	D	D	*
	Manual Landing (All Engines Operative)	Minor differences (flare height)	Yes	No	D	D	*
	Non-ILS approach	Minor differences (No integrated approach navigation)	No	Yes	C	C	*
	HUD Maneuvers (if installed)	Takeoff – All Engines Instrument Approach – All Engines Takeoff - Engine Failure/V1 Instrument Approach - Engine Inoperative Go-Around – Engine Inoperative	No	No	D	D	*

(*) Not evaluated by ANAC

This Design Differences table, from the 787-8 to 787-9, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-8 TO RELATED AIRCRAFT: 787-9	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Dimensions	Length = 206 feet, 1 inch (62.82 meters) Height = 55 feet, 10 inches (17.02 meters) Wing Span = 197 feet, 3 inches (60.3 meters) Nose gear to main gear = 84.9 feet	No	No	A	A	A
	Limitations	Weight/CG difference Changed flap placard to show 10, 17, and 18 flap speeds	No	No	A	A	A
	ATA 21 Air Conditioning	Deleted alternate ventilation valve Added 1:00 position to outflow valve indication	No	No	A	A	A
	ATA 27 Flight Controls	Added takeoff flap settings 10, 17, 18	No	No	A	A	A
	ATA 28 Fuel	Increased fuel capacity: • Mains = 36,984 lb each • Center = 149,678 lb • Total = 223,646 lb	No	No	A	A	A
	ATA 70 Powerplant	Increased thrust ratings	No	No	A	A	A

This Maneuver Differences table, from the 787-8 to 787-9, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-8 TO RELATED AIRCRAFT: 787-9	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Takeoff Procedures	Added takeoff flap positions 10, 17, 18	No	No	A	A	A
	HUD Maneuvers (if installed)	Takeoff – two engines Landing – two engines Engine failure at V1 Approach – one engine inop Go-around – one engine inop Landing – one engine inop	No	No	D	D	A

This Design Differences table, from the 787-8 to 787-10, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-8 TO RELATED AIRCRAFT: 787-10	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Dimensions	Length = 224 feet, 1 inch (68.3 meters) Height = 55 feet, 10 inches (17.0 meters) Wing span = 207 feet, 10 inches (63.3 meters) Nose gear to main gear = 94 feet, 9 inches	No	No	A	A	A
	Limitations	Weight/CG difference Changed flap placard to show 10, 17, and 18 flap speeds Maximum operating altitude 41,100 feet	No	No	A	A	A
	ATA 21 Air Conditioning	Deleted alternate ventilation valve Added 1:00 Position to Outflow Valve Indication	No	No	A	A	A
	ATA 27 Flight Controls	Added takeoff flap settings 10, 17, 18	No	No	A	A	A
	ATA 28 Fuel	Increased fuel capacity: • Mains = 36,984 lb each • Center = 149,678 lb • Total = 223,646 lb	No	No	A	A	A
	ATA 32 Landing Gear	Added semi-levered gear	No	No	A	A	A
	ATA 70 Powerplant	Increased thrust ratings	No	No	A	A	A

This Maneuver Differences table, from the 787-8 to 787-10, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-8 TO RELATED AIRCRAFT: 787-10	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Exterior Preflight	Added semi-levered gear	No	No	A	A	A
	Takeoff Procedures	Added takeoff flap positions 10, 17, 18	No	No	A	A	A
	HUD Maneuvers (if installed)	Takeoff – two engines Landing – two engines Engine failure at V1 Approach – one engine inop Go-around – one engine inop Landing – one engine inop	No	No	D	D	A

This Design Differences table, from the 787-9 to 787-8, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-9 TO RELATED AIRCRAFT: 787-8	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Dimensions	Length = 186 feet, 1 inches (56.74 meters) Height = 55 feet, 6 inches (16.92 meters) Wing span = 197 feet, 3 inches (60.12 meters) Nose Gear to Main Gear = 74.9 feet, (22.80 meters)	No	No	A	A	A
	Limitations	Weight/CG difference Changed flap placard to remove 10, 17, and 18 flap speeds	No	No	A	A	A
	ATA 21 Air Conditioning	Added alternate ventilation valve Removed 1:00 position from outflow valve indication	No	No	A	A	A
	ATA 27 Flight Controls	Removed takeoff flap settings 10, 17, 18	No	No	A	A	A
	ATA 28 Fuel	Decreased fuel capacity: • Mains = 37,319 lb each • Center = 148,740 lb • Total = 223,378 lb	No	No	A	A	A
	ATA 70 Powerplant	Decreased thrust ratings	No	No	A	A	A

This Maneuver Differences table, from the 787-9 to 787-8, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-9 TO RELATED AIRCRAFT: 787-8	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Takeoff Procedures	Removed takeoff flap positions 10, 17, 18	No	No	A	A	A
	HUD Maneuvers (if installed)	Takeoff – two engines Landing – two engines Engine failure at V1 Approach – one engine inop Go-around – one engine inop Landing – one engine inop	No	No	D	D	A

This Design Differences table, from the 787-9 to 787-10, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-9 TO RELATED AIRCRAFT: 787-10	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Dimensions	Length = 224 feet, 1 inch (68.3 meters) Height = 55 feet, 10 inches (17.0 meters) Wing span = 207 feet, 10 inches (63.3 meters) Nose gear to main gear = 94 feet, 9 inches	No	No	A	A	A
	Limitations	Weight/CG difference Maximum operating altitude 41,100 feet	No	No	A	A	A
	ATA 32 Landing Gear	Added semi-levered gear	No	No	A	A	A
	ATA 70 Powerplant	Increased thrust ratings	No	No	A	A	A

This Maneuver Differences table, from the 787-9 to 787-10, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-9 TO RELATED AIRCRAFT: 787-10	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Exterior Preflight	Added semi-levered gear	No	No	A	A	A
	HUD Maneuvers (if installed)	Takeoff – two engines Landing – two engines Engine failure at V1 Approach – one engine inop Go-around – one engine inop Landing – one engine inop	No	No	D	D	A

This Design Differences table, from the 787-10 to 787-8, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-10 TO RELATED AIRCRAFT: 787-8	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Dimensions	Length = 186 feet, 1 inch (56.74 meters) Height = 55 feet, 6 inches (16.92 meters) Wing span = 197 feet, 3 inches (60.12 meters) Nose gear to main gear = 74.9 feet (22.80 meters)	No	No	A	A	A
	Limitations	Weight/CG difference Changed flap placard to remove 10, 17, and 18 flap speeds Maximum operating altitude 43,100 feet	No	No	A	A	A
	ATA 21 Air Conditioning	Added alternate ventilation Valve Removed 1:00 position from outflow valve indication	No	No	A	A	A
	ATA 27 Flight Controls	Removed takeoff flap settings 10, 17, 18	No	No	A	A	A
	ATA 28 Fuel	Decreased fuel capacity: • Mains = 37,319 lb each • Center = 148,740 lb • Total = 223,378 lb	No	No	A	A	A
	ATA 32 Landing Gear	Removed semi-levered gear	No	No	A	A	A
	ATA 70 Powerplant	Decreased thrust ratings	No	No	A	A	A

This Maneuver Differences table, from the 787-10 to 787-8, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-10 TO RELATED AIRCRAFT: 787-8	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Exterior Preflight	Removed semi-levered gear	No	No	A	A	A
	Takeoff Procedures	Removed takeoff flap positions 10, 17, 18	No	No	A	A	A
	HUD Maneuvers (if installed)	Takeoff – two engines Landing – two engines Engine failure at V1 Approach – one engine inop Go-around – one engine inop Landing – one engine inop	No	No	D	D	A

This Design Differences table, from the 787-10 to 787-9, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-10 TO RELATED AIRCRAFT: 787-9	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Dimensions	Length = 206 feet, 1 inch (62.82 meters) Height = 55 feet, 10 inches (17.02 meters) Wing span = 197 feet, 3 inches (60.3 meters) Nose Gear to Main Gear = 84.9 feet	No	No	A	A	A
	Limitations	Weight/CG difference Maximum operating altitude 43,100 feet	No	No	A	A	A
	ATA 32 Landing Gear	Removed semi-levered gear	No	No	A	A	A
	ATA 70 Powerplant	Decreased thrust ratings	No	No	A	A	A

This Maneuver Differences table, from the 787-10 to 787-9, was proposed by The Boeing Company and validated by the ANAC. It lists the minimum differences levels operators must use to conduct differences training, checking and currency of flightcrew members.

FROM BASE AIRCRAFT: 787-10 TO RELATED AIRCRAFT: 787-9	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Exterior Preflight	Removed semi-levered gear	No	No	A	A	A
	HUD Maneuvers (if installed)	Takeoff – two engines Landing – two engines Engine failure at V1 Approach – one engine inop Go-around – one engine inop Landing – one engine inop	No	No	D	D	A

Appendix 3 – BOEING 787 FULL INITIAL TYPE RATING

Example of Boeing 787 full initial type rating training footprint.

Day 1	Day 2	Day 3	Day 4	Day 5
Intro (01:00)	CBT (07:00)	CBT (03:00)	CBT (03:00)	CBT (03:00)
CBT (06:00)		FTD 1 (02:00)	FTD 2 (02:00)	FTD 3 (02:00)
Day 6	Day 7	Day 8	Day 9	Day 10
CBT (03:00)	CBT (03:30)	CBT (03:30)	CBT (03:30)	CBT (03:30)
FTD 4 (02:00)	FTD 5 (02:00)	FTD 6 (02:00)	FTD 7 (02:00)	FTD 8 (02:00)
Day 11	Day 12	Day 13	Day 14	Day 15
CBT (03:30)	CBT (02:00)	FFS 1 (04:00)	FFS 2 (04:00)	FFS 3 (04:00)
FTD 9 (02:00)	FTD 10 (04:00)			
Day 16	Day 17	Day 18	Day 19	Day 20
FFS 4 (04:00)	FFS 5 (04:00)	FFS 6 (04:00)	FFS 7 (04:00)	FFS XQ (proficiency check)
Legend: CBT – Computer Based Training FTD – Flight Training Device level 5 or higher FFS – Full Flight Simulator level C or D				
Note: FTD and FFS sessions DO NOT INCLUDE time for briefing and debriefing.				

Appendix 4 – BOEING 787 REDUCED INITIAL TYPE RATING

Example of Boeing 787 reduced initial type rating training (Shortened Type Rating – STAR) footprint.

Applicable for pilots who are current and qualified either on the B737-300/900 with EFIS/PFD-ND and FMS, the B747-400/-8, or on the B757/767.

Day 1	Day 2	Day 3	Day 4	Day 5
787 Intro (02:00)	CBT (03:30)	CBT (03:30)	CBT (03:30)	CBT (03:30)
CBT (05:00)	FTD 1 (02:00)	FTD 2 (02:00)	FTD 3 (02:00)	FTD 4 (02:00)
Day 6	Day 7	Day 8	Day 9	Day 10
CBT (03:30)	CBT (01:30)	FFS 1 (04:00)	FFS 2 (04:00)	FFS 3 (04:00)
FTD 5 (02:00)	FTD 6 (04:00)			
Day 11	Day 12	Day 13		
FFS 4 (04:00)	FFS 5 (04:00)	FFS XQ (proficiency check)		
Legend: CBT – Computer Based Training FTD – Flight Training Device level 5 or higher FFS – Full Flight Simulator level C or D				
Note: FTD and FFS sessions DO NOT INCLUDE time for briefing and debriefing.				

Appendix 5 – BOEING 777 TO BOEING 787 DIFFERENCES TRAINING

Example of Boeing 777 to Boeing 787 differences training footprint.

Day 1	Day 2	Day 3
Intro (02:00)	CBT (01:30)	CBT (01:30)
CBT (05:00)	FTD 1 (04:00)	FTD 2 (04:00)
Day 4	Day 5	
CBT (02:00)	FFS XQ (partial proficiency check)	
FFS 1 (04:00)		
Legend: CBT – Computer Based Training FTD – Flight Training Device level 5 or higher FFS – Full Flight Simulator level C or D		
Note: FTD and FFS sessions DO NOT INCLUDE time for briefing and debriefing.		