CONSTANTA

OPERATION MANUAL. PART B.
OPERATING PROCEDURES BOEING 737-300

КЕРІВНИЦТВО З ЕКСПЛУАТАЦІЇ. ЧАСТИНА B.
ЕКСПЛУАТАЦІЙНІ ПРОЦЕДУРИ BOEING 737-300

Issue Видання	**Issue Date** Дата видання	**Revision** Зміна	**Revision Date** Дата Зміни
0	**26.02.2024**	**4**	**04.04.2025**

OM-B
Copy No 3

OPERATION MANUAL. PART B. OPERATION PROCEDURES BOEING 737-300

КЕРІВНИЦТВО З ЕКСПЛУАТАЦІЇ. ЧАСТИНА В. ЕКСПЛУАТАЦІЙНІ ПРОЦЕДУРИ BOEING 737-300

OM-B

Issue Видання	**Issue Date** Дата видання	**Revision** Зміна	**Revision Date** Дата Зміни	**Change Type** Тип Зміни			
0	**26.02.2024**	**4**	**04.04.2025**	**Major** Головна	☐	**Minor** Другорядна	☒

Approved by: Затверджено: **Accountable Manager** Відповідальний керівник — **Vadym VDOVENKO** Вадим ВДОВЕНКО

Prepared by: Розроблено: **Flight Operations Manager** Керівник з льотної експлуатації — **Vladyslav TYKHONENKO** Владислав ТИХОНЕНКО

Agreed by: Погоджено: **Quility and Compliance Monitoring** Керівник з якості та моніторингу відповідності — **Mariia SAVKA** Марія САВКА

Електронний підпис
Вдовенко Вадим Вікторович
ЄДРПОУ/ІПН 20508143
Підписано у Вчасно

Електронний підпис
Савка Марія Іванівна-Володимирівна
ЄДРПОУ/ІПН 20508143
Підписано у Вчасно

Електронний підпис
Тихоненко Владислав Владиленович
ЄДРПОУ/ІПН 20508143
Підписано у Вчасно

STATE AVIATION ADMINISTRATION OF UKRAINE
ДЕРЖАВНА АВІАЦІЙНА СЛУЖБА УКРАЇНИ

UB
Державіаслужба
№20/20.1-589-25 від 10.04.2025
КЕП: Дьомін Е. В. 10.04.2025 16:46
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Документ підписано у сервісі Вчасно (початок)
Approval Page OM-B issue 0 rev.04 dd.04.04.2025.pdf

Документ підписано у сервісі Вчасно (продовження)
Approval Page OM-B issue 0 rev.04 dd.04.04.2025.pdf

Документ відправлено: 13:34 04.04.2025

Відправник документу

Електронний підпис
13:34 04.04.2025
ЄДРПОУ/ІПН: 20508143
Юр. назва: ПрАТ "Авіакомпанія Константа"
Власник ключа: Тихоненко Владислав Владиленович
Час перевірки КЕП/ЕЦП: 13:34 04.04.2025
Статус перевірки сертифікату: Сертифікат діє
Серійний номер: 2DBD5940D955E12A040000008A34030098111000
Тип підпису: кваліфікований
Тип сертифікату: кваліфікований

Електронний підпис
13:35 04.04.2025
ЄДРПОУ/ІПН: 20508143
Юр. назва: ПРИВАТНЕ АКЦІОНЕРНЕ ТОВАРИСТВО "АВІАКОМПАНІЯ КОНСТАНТА"
Власник ключа: Савка Марія Іванівна-Володимирівна
Час перевірки КЕП/ЕЦП: 13:35 04.04.2025
Статус перевірки сертифікату: Сертифікат діє
Серійний номер: 2DBD5940D955E12A04000000D7640200F2520B00
Тип підпису: кваліфікований
Тип сертифікату: кваліфікований

Електронний підпис
13:42 04.04.2025
ЄДРПОУ/ІПН: 20508143
Юр. назва: ПрАТ "Авіакомпанія Константа"
Генеральний директор: Вдовенко Вадим Вікторович
Час перевірки КЕП/ЕЦП: 13:42 04.04.2025
Статус перевірки сертифікату: Сертифікат діє
Серійний номер: 2DBD5940D955E12A0400000041BD0200C44D0D00
Тип підпису: кваліфікований
Тип сертифікату: кваліфікований

PART B OM
ЧАСТИНА В. КЕ

OM-B

Issue Видання	Issue Date Дата видання	Revision Зміна	Revision Date Дата Зміни	Change Type Тип Зміни			
0	26.02.2024	3	15.03.2025	Major Головна	☐	Minor Другорядна	☒

Approved by: Затверджено:	**Accountable Manager** Відповідальний керівник	**Vadym VDOVENKO** Вадим ВДОВЕНКО
Prepared by: Розроблено:	**Flight Operations Manager** Керівник з льотної експлуатації	**Vladyslav TYKHONENKO** Владислав ТИХОНЕНКО
Accepted by: Погоджено:	**Quility and Compliance Monitoring** Керівник з якості та моніторингу відповідності	**Mariia SAVKA** Марія САВКА

Електронний підпис
Вдовенко
Вадим
Вікторович
ЄДРПОУ/ІПН
20508143
Підписано у Вчасно

Електронний підпис
Савка Марія
Іванівна-Володимирівна
ЄДРПОУ/ІПН
20508143
Підписано у Вчасно

Електронний підпис
Тихоненко
Владислав
Владиленович
ЄДРПОУ/ІПН
20508143
Підписано у Вчасно

STATE AVIATION ADMINISTRATION OF UKRAINE
ДЕРЖАВНА АВІАЦІЙНА СЛУЖБА УКРАЇНИ

UB
Державіаслужба
№20/20.1-540-25 від 01.04.2025
КЕП: Дьомін Е. В. 01.04.2025 11:55
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Документ підписано у сервісі Вчасно (початок)

Документ підписано у сервісі Вчасно (продовження)
QMS.PR-01.02 - ЛС КЕ Ч. В П is.0 rev.03 dd.15.03.2025.pdf

Документ відправлено: 12:00 15.03.2025

Відправник документу

Електронний підпис
12:00 15.03.2025
ЄДРПОУ/ІПН: 20508143
Юр. назва: ПрАТ "Авіакомпанія Константа"
Власник ключа: Тихоненко Владислав Владиленович
Час перевірки КЕП/ЕЦП: 11:59 15.03.2025
Статус перевірки сертифікату: Сертифікат діє
Серійний номер: 2DBD5940D955E12A040000008A34030098111000
Тип підпису: кваліфікований
Тип сертифікату: кваліфікований

Електронний підпис
12:01 15.03.2025
ЄДРПОУ/ІПН: 20508143
Юр. назва: ПРИВАТНЕ АКЦІОНЕРНЕ ТОВАРИСТВО "АВІАКОМПАНІЯ КОНСТАНТА"
Власник ключа: Савка Марія Іванівна-Володимирівна
Час перевірки КЕП/ЕЦП: 12:01 15.03.2025
Статус перевірки сертифікату: Сертифікат діє
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Тип підпису: кваліфікований
Тип сертифікату: кваліфікований

Електронний підпис
13:04 15.03.2025
ЄДРПОУ/ІПН: 20508143
Юр. назва: ПрАТ "Авіакомпанія Константа"
Генеральний директор: Вдовенко Вадим Вікторович
Час перевірки КЕП/ЕЦП: 13:04 15.03.2025
Статус перевірки сертифікату: Сертифікат діє
Серійний номер: 2DBD5940D955E12A0400000041BD0200C44D0D00
Тип підпису: кваліфікований
Тип сертифікату: кваліфікований

QMS.PR-01.02

APPROVAL SHEET / ЛИСТ СХВАЛЕННЯ

Part B OM "Aircompany Constanta" PrJSC
Частини В КЕ ПрАТ "Авіакомпанія Константа"

Issue / Видання	Issue Date / Дата видання
0	**26.02.2024**
Revision / Зміна	Revision Date/ Дата Зміни
02	**08.01.2025**
Type of Change / Тип Зміни	
Major / Головна	Minor / Другорядна
☐	☑

Approved: Затверджено:	Accountable Manager Відповідальний керівник	Signature /Підпис	V. Vdovenko В. В. Вдовенко
Control: Контроль:	Compliance Monitoring Manager Керівник моніторингу відповідності	Signature / Підпис	M. Savka М. І. Савка
Prepared: Підготував:	Flight Operations Manager Керівник з льотної експлуатації	Signature / Підпис	V. Tykhonenko В.В. Тихоненко

STATE AVIATION ADMINISTRATION OF UKRAINE
ДЕРЖАВНА АВІАЦІЙНА СЛУЖБА УКРАЇНИ

UB
Державіаслужба
№20/20.1-200-25 від 03.02.2025
КЕП: Дьомін Е. В. 03.02.2025 12:31
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QMS.PR-01.02

APPROVAL SHEET / ЛИСТ СХВАЛЕННЯ

Part B OM “Aircompany Constanta” PrJSC
Частини В КЕ ПрАТ “Авіакомпанія Константа”

Issue / Видання	Issue Date / Дата видання
0	**26.02.2024**
Revision / Зміна	Revision Date/ Дата Зміни
01	**14.10.2024**

Type of Change / Тип Зміни

Major / Головна	Minor / Другорядна
☐	☑

Approved: Затверджено:	Accountable Manager Відповідальний керівник	Signature /Підпис	V. Vdovenko В. В. Вдовенко
Control: Контроль:	Compliance Monitoring Manager Керівник моніторингу відповідності	Signature / Підпис	M. Savka М. І. Савка
Prepared: Підготував:	Flight Operations Manager Керівник з льотної експлуатації	Signature / Підпис	V. Tykhonenko В.В. Тихоненко

STATE AVIATION ADMINISTRATION OF UKRAINE
ДЕРЖАВНА АВІАЦІЙНА СЛУЖБА УКРАЇНИ

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Державіаслужба
№20/20.1-1865-24 від 05.11.2024
КЕП: Дьомін Е. В. 05.11.2024 17:23
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APPROVAL SHEET / ЛИСТ СХВАЛЕННЯ

Part B OM "Aircompany Constanta" PrJSC
Частини В КЕ ПрАТ "Авіакомпанія Константа"

Issue / Видання	Issue Date / Дата видання
0 / Нульове	**26.02.2024**
Revision / Зміна	Revision Date/ Дата Зміни
00	**26.02.2024**
Type of Change / Тип Зміни	
Major / Головна	Minor / Другорядна
☑	☐

Approved: Затверджено:	Accountable Manager Відповідальний керівник	Signature /Підпис	V. Vdovenko В. В. Вдовенко
Control: Контроль:	Compliance Monitoring Manager Керівник моніторингу відповідності	Signature / Підпис	M. Savka М. І. Савка
Accepted: Погоджено:	Continuing Airworthiness Management Manager Керівник з управління підтриманням льотної придатності	Signature / Підпис	O. Kolesova Колєсова О.А.
Prepared: Підготував:	Flight Operations Manager Керівник з льотної експлуатації	Signature / Підпис	S Ivashchenko С. М. Іващенко

STATE AVIATION ADMINISTRATION OF UKRAINE
ДЕРЖАВНА АВІАЦІЙНА СЛУЖБА УКРАЇНИ

UB
Державіаслужба
№20/20.1-812-24 від 26.04.2024
КЕП: Дьомін Е. В. 26.04.2024 13:38
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LIST OF EFFECTIVE PAGES

ПЕРЕЛІК ДІЮЧИХ СТОРІНОК

LEP / ПДС		
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LEP-2	04	04.04.2025
LEP-3	04	04.04.2025
LEP-4	00	26.02.2024
Revision History / Облік змін		
Page / Сторінка	*Revision / Зміна*	*Date / Дата*
RH-1	04	04.04.2025
RH-2	00	26.02.2024
History of temporary revisions / Облік тимчасових змін		
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HTR-1	00	26.02.2024
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Revision Highlights / Основні моменти ревізії		
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RHL-2	04	04.04.2025
Chapter 0 / Розділ 0		
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Chapter 3 / Розділ 3

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3-1	00	26.02.2024
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Chapter 4 / Розділ 4

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4-1	00	26.02.2024
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Chapter 5 / Розділ 5

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Chapter 6 / Розділ 6

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6-1	00	26.02.2024
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6-3	01	14.10.2024
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6-8	03	15.03.2025
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Chapter 7 / Розділ 7

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7-1	00	26.02.2024

7-2	00	26.02.2024
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Chapter 8 / Розділ 8		
Page / Сторінка	*Revision / Зміна*	*Date / Дата*
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Chapter 9 / Розділ 9		
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9-1	00	26.02.2024
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Chapter 10 / Розділ 10		
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Chapter 11 / Розділ 11		
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11-1	00	26.02.2024
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Chapter 12 / Розділ 12		
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Chapter 13 / Розділ 13		
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13-9	00	26.02.2024
13-10	00	26.02.2024

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Навмисно залишена незаповненою

REVISION HISTORY ОБЛІК ЗМІН ТА ДОПОВНЕНЬ

Issue No *Видання№*	Issue date *Дата видання*	Revision No *Ревізія №*	Date of Revision *Дата ревізії*	Modified Section *Розділ застосування*	Short description of the Modification *Короткий опис зміни, що вноситься*
0	26.02.2024	0	26.02.2024	All the document	**Original** edition. Оригінальне видання.
0	26.02.2024	1	14.10.2024	Sec. 2, 4, 5, 6, 10	Внесення змін до стандартних чек-листів. Внесення доповнень до CDU Preflight procedure. Внесення доповнень стосовно застосовних одиниць виміру мас та ваги. Додано бланки LIR, Loadsheet and Trimsheet застосовних при розрахунках з використанням програмного забезпечення. Внесення змін в схему розміщення аварійно-рятувального обладнання. Changes to normal checklists. Additions to the CDU Preflight procedure. Amendments to the applicable units of mass and weight measurement. Added LIR, Loadsheet and Trimsheet forms applicable to calculations using software. Amendments to the of Emergency Equipment Layout.
0	26.02.2024	2	08.01.2025	Sec. 2, 3, 5	Додано процедури щодо MNPS експлуатації в повітряному просторі NAT HLA Added procedures for MNPS operations in NAT HLA airspace
0	26.02.2024	3	15.03.2025	Sec.6, 10	Оновлено бланки LIR and Trimsheet, Внесення змін в схему розміщення аварійно-рятувального обладнання. Updated LIR and Trimsheet forms Changes to the Emergency Equipment Layout.
0	26.02.2024	4	04.04.2025	Sec. 10	Внесення змін в схему розміщення аварійно-рятувального обладнання. Changes to the Emergency Equipment Layout.

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REVISION HIGHLIGTS

КЛЮЧОВІ МОМЕНТИ РЕВІЗІЇ

Розділ *Section*	Сторінка *Page*	Зміна *Revision*	Дата *Date*	Зміст зміни *Revision content*
2	2-9; 2-10	01	14.10.2024	Зміна стандартного чек-листа. Changes to the normal checklist.
2	2-21	01	14.10.2024	Доповнення до CDU Preflight procedure. Amendments to the CDU Preflight procedure.
4	4	01	14.10.2024	Доповнення до процедури Take-Off Weight Calculation. Amendments to the Take-Off Weight Calculation procedure.
5	3	01	14.10.2024	Уточнення процедури Pre-Flight and In-Flight Planning. Clarification of the Pre-Flight and In-Flight Planning procedure.
5	4	01	14.10.2024	Уточнення методу розрахунку палива та мастила. Clarification of Fuel and Oil Calculation Method.
5	8	01	14.10.2024	Уточнення процедури контролю палива в польоті. Clarification of the Fuel Monitoring In Flight procedure.
6	6-3	01	14.10.2024	Уточнення процедури заповнення документації з розрахунку маси та центрування. Clarification of the mass and balance documentation completion procedure.
6	6-4	01	14.10.2024	Додано опис програмного забезпечення з розрахунку маси та центрування та форм, що ним генеруються. Added a description of the mass and balance calculation software and the output forms generated with this software.
6	6-5	01	14.10.2024	Додано зразок Load Sheet & Trim Sheet form FO. FORM-16, яку сгенеровано за допомогою програмного забезпечення EVIONICA. Added an example of a Load Sheet & Trim Sheet form FO. FORM-16 generated by the EVIONICA software
6	6-6	01	14.10.2024	Додано зразок Onloading & Offloading Instructions form FO.FORM-15, яку сгенеровано за допомогою програмного забезпечення EVIONICA. Added an example of a Onloading & Offloading Instructions form FO.FORM-15 generated by the EVIONICA software.
6	6-7, 6-8, 6-9	01	14.10.2024	Додано опис документації щодо маси та центрування для розрахунків вручну Added mass and balance documentation description for manual calculation
6	6-10	01	14.10.2024	Уточнено нумерацію. Clarified numbering.
10	10-11	01	14.10.2024	Зміни до схеми розміщення аварійно-рятувального обладнання. Changes to the Emergency Equipment Layout.
2	2-59	02	08.01.2025	Додано Нормальні процедури з експлуатації за MNPS у повітряному просторі NAT HLA Added Normal procedures for MNPS operation within NAT HLA airspace

Розділ *Section*	Сторінка *Page*	Зміна *Revision*	Дата *Date*	Зміст зміни *Revision content*
3	3-6	02	08.01.2025	Додано посилання на MNPS Manual FO.REG-06 при відмові систем Added a link to MNPS Manual FO.REG-06 in case of system failure
5	5-3	02	08.01.2025	Додано деталі планування польотів для операцій MNPS Added details of flight planning for MNPS operations
5	5-9	02	08.01.2025	Додано деталі розрахунку та записів щодо палива для операцій MNPS Added details of fuel calculation and recording for MNPS operations
6	6-8	03	15.03.2025	Оновлено бланк Trim sheet Updated Trim sheet form
6	6-9	03	15.03.2025	Оновлено бланк LIR Updated LIR form
10	10-11	03	15.03.2025	Зміни до схеми розміщення аварійно-рятувального обладнання. Changes to the Emergency Equipment Layout.
10	10-11	04	04.04.2025	Зміни до схеми розміщення аварійно-рятувального обладнання. Changes to the Emergency Equipment Layout.

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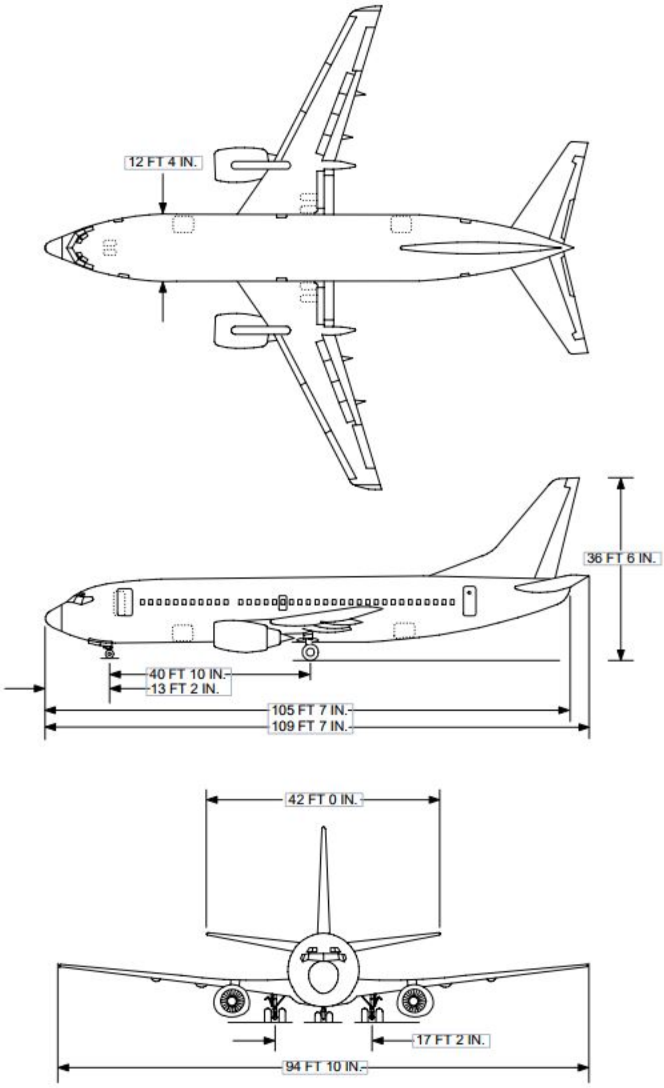
0. GENERAL INFIRMATION AND UNITS OF MEASUREMENT

0.1. Airplane Dimensions



For general information refer to respective FCOM/AFM.

0.2. Units of Measurements

	Metric -- > US			US – > Metric		
Length	1 millimetre	Mm	0.0394 in	1 inch	in	25.4 mm
	1 metre	M	1.094 yd	1 yard	yd	0.914 m
	1 kilometre	Km	0.540 nm	1 nautical mile	nm	1.852 km
Speed	1 metre/second	m/s	3.281 ft/s	1 foot/second	ft/s	0.3048 m/s
	1 kilometre/hour	km/h	0.540 kt	1 knot	kt	1.852 km/hr
Weight	1 gram	G	0.353 oz	1 ounce	oz	28.35 g
	1 kilogram	Kg	2.2046 lb	1 pound	lb	0.4536 kg
	1 ton	Ton	2,204.6 lb	1 pound	lb	0.0004536 ton
Force	1 newton	N	0.2248 lb	1 pound	lb	4.448 N
	1 decanewton	DaN	2.248 lb	1 pound	lb	0.4448 DaN
Pressure	1 bar	Bar	14.505 psi	1 pound per square inch	lb/in^2	0.0689 bar
	1 millibar	Mbar	0.0145 psi	1 pound per square inch	lb/in^2	68.92 mbar
Volume	1 litre	L	0.2642 USgal	1 US Gallon	USgal	3.785 l
	1 cubic metre	m^3	264.2 USgal	1 US Gallon	USgal	0.003785 m^3
Momentum	1 metre x decanewton	mDaN	88.50 lbin	1 pound x inch	lbin	0.0113 mDaN

0.3. Conversion Tables

Reference: Refer to FCOM

0.4. Explanations / Definitions and Abbreviation

0.4.1. Definitions

Block Time - The time between an aeroplane first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are stopped.

Captain – Equal to Pilot in Command (PIC).

Cargo - In relation to Commercial Air Transportation, any property, including animals and mail, carried by an airplane other than stores and accompanied baggage.

Commercial Air Transport Operation - An airplane operation involving the transport of passengers and/or cargo for remuneration or hire.

Critical Phases of Flight - Critical phases of flight are the take-off run, the take-off flight path, the final approach, the landing, including the landing roll, and any other phases of flight at the discretion of the commander.

Dangerous Goods - Articles or substances which are capable of posing significant risk to health, safety or property when transported by air

Estimated Off-Block Time - The estimated time at which the airplane will commence movement associated with departure

Exemption - A formal authorization issued by the Authority providing relief from part or all of the provisions. The authorization may or may not be conditional.

Final Reserve Fuel - An amount of fuel, required to fly for 30 minutes at holding speed and at 1500 ft. MSL/ISA conditions calculated with regard to the expected landing mass at the alternate aerodrome (or at destination - if no alternate is required)

Flight Time - The total time from the moment an airplane first moves under its own power for the purpose of taking off until the moment it comes to rest at the end of the flight for the purpose of unloading persons

Handling Agent - An agency, which performs on behalf of the operator some or all of the latter's functions including receiving, loading, unloading, transferring or other processing of passengers or cargo

ILS Critical Area - An area of defined dimensions about the localiser and glide path antennas where vehicles, including aircraft, are excluded during all ILS operations. The critical area is protected because of the presence of vehicles and/or aircraft inside its boundaries will cause unacceptable disturbance to the ILS signal in space

ILS Sensitive Area - An area extending beyond the critical area where the parking and/or movement of vehicles, including aircraft, is controlled to prevent the possibility of unacceptable interference to the ILS signal during ILS operations. The sensitive area is protected to provide protection against interference caused by large moving objects outside the critical area but still normally within the airfield boundary.

Instrument flight time - Time during which a pilot is piloting an airplane solely by reference to instruments and without external reference points

Instrument Runway Visual Range - Is the RVR measured at the Touchdown, Midpoint, and Stop-end of the runway

Master Minimum Equipment List (MMEL) - Means a master list (including a preamble) appropriate to an aircraft type which determines those instruments, items of equipment or functions that, while maintaining the level of safety intended in the applicable airworthiness certification specifications, may temporarily be inoperative either due to the inherent redundancy of the design, and/or due to specified operational and maintenance procedures, conditions and limitations, and in accordance with the applicable procedures for continued airworthiness

Minimum Equipment List (MEL) - Means a list (including a preamble) which provides for the operation of aircraft, under specified conditions, with particular instruments, items of equipment or functions inoperative at the commencement of flight. This list is prepared by the operator for his own particular aircraft taking account of their aircraft definition and the relevant operational and maintenance conditions in accordance with a procedure approved by the Authority.

Maximum Certified Take-Off Weight - The maximum total weight of the airplane and its contents, at which the airplane may take off anywhere in the world, in the most favorable circumstances, in accordance with the certificate of airworthiness in force in respect of the airplane

Obstacle Free Zone - Specified upper limits which is kept clear of all obstacles except for minor specified items.

Pilot Flying - is responsible for managing and engaged in flying the aircraft (even when the aircraft is under autopilot control) and avoids tasks or activities that distract from that engagement.

Pilot Monitoring - is responsible for monitoring the current and projected flight path and energy of the aircraft at all times and monitors the aircraft and system states, calls out any perceived or potential deviations from the intended flight path, and intervenes if necessary. He supports the PF at all times, staying abreast of all air traffic control instructions and clearances and aircraft state

Transfer of PF and PM roles - should be done positively with verbal assignment (“MY CONTROL”) and verbal acceptance to include a short brief of aircraft state. If the PF needs to engage in activities that would distract from aircraft control, the PF should transfer aircraft control to the other pilot, and then assume the PM role.

Block Time - The time between an aeroplane first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are stopped

Operational Control - The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the flight

Operator - A person, organization or enterprise engaged, or intending to engage in an airplane operation

Pilot-in-Command - A pilot who for the time being is in charge of piloting the airplane, without being under the direction of any other pilot in the airplane

Pre-flight Inspection - This means the inspection carried out before flight to ensure that the airplane is fit for the intended flight. It does not include defect rectification

Quality Assurance - All those planned and systematic actions necessary to provide adequate confidence that operations are conducted in accordance with all applicable requirements, procedures and instructions.

Quality Audit - A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives

Quality Inspection - Are followed during the accomplishment of that audit

Quality System - The organizational structure, responsibilities, procedures and resources for implementing quality management

State of Origin for Dangerous Goods - The Authority in whose territory the dangerous goods were first loaded on the airplane.

State of Registry - The State on whose register the airplane is entered.

State of the Operator - The State in which the Operator has his principal place of business.

Weight - Weight and Mass are considered to be equivalent in this manual.

0.4.2. Abbreviations

AAL	Above Aerodrome Level
ACARS	Airplane Communications Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
ACN	Aircraft Classification Number
ADI	Attitude Director Indicator
ADF	Automatic Direction Finder
ADI	Attitude Director Indicator
AFM	Airplane Flight Manual
AFCS	Automatic Flight Control System
AFTN	Aeronautical Fixed Telecommunication Network
AFIS	Aerodrome Flight Information Service
AGL	Above Ground Level
AIC	Aeronautical Information Circular
AP	Autopilot
APD	Approach Progress Display
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
AMSL	Above Mean Sea Level
AOC	Air Operator Certificate
AOM	Airplane Operating Manual
APU	Auxiliary Power Unit
ASD	Accelerate Stop Distance
ASDA	Accelerate Stop Distance Available
ATA	Actual Time of Arrival
ATC	Air Traffic Control
ATD	Actual Time of Departure
ATIS	Automatic Terminal Information Service
ATPL	Airline Transport Pilot License
ATS	Air Traffic Service
BECMG	Becoming
CAA	Civil Aviation Authority (see GCAA for Georgian Authority)
C/A	Cabin Attendant
CAT	Clear Air Turbulence
CAT II/III	Category II/III, All Weather Operations
CAVOK	Ceiling and Visibility OK
CB	Cumulonimbus
CBT	Computer Based Training
CCC	Crew Co-ordination Concept
CDL	Configuration Deviation List
CEC	Cabin Emergency Checklist
CFIT	Controlled Flight Into Terrain
CFMU	Central Flow Management Unit
CFP	Computerized Flight Plan
CG	Center of Gravity
CL	Runway Center line Lights
CN	Company Notice
CPL	Commercial Pilot License
CMD (PIC)	Commander (Pilot in command)
CP	Co-pilot

3

CR	Company Report
CRM	Crew Resource Management
DA	Decision Altitude
DA/H	Decision Altitude/Height
DGR	Dangerous Goods Regulations
DH	Decision Height
DME	Distance Measuring Equipment
DMS	Digital Manual system
DOI	Dry Operating Index
DOM	Dry Operating Mass
EADI	Electronic Attitude Director Indicator
EAG	European Aeronautical Group
EALT	En-route Alternate
EAT	Expected Approach Time
ECAC	European Civil Aviation Conference
EFIS	Electronic Flight Instrument System
EHSI	Electronic Horizontal Situation Indicator
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
ETOPS	Extended Twin Engine Operation
FAA	Federal Aviation Administration
FAM	Final Approach Monitor
FBS	Fixed Base Simulator
FCL	Flight Crew Licensing
FD	Flight Director
FDM	Flight Data Monitoring
FFS	Full Flight Simulator
FIS	Flight Information Service
FL	Flight level
FMC	Flight Management Computer
FMS	Flight Management System
FOM	Flight Operations Manager
FPM	Feet Per Minute
FSO	Flight Safety Officer
FSU	Flight Support Unit
FT/ft	Feet
FTL	Flight Time Limitations
G	Gusts
GHS	Ground Handling Supervisor
GM	General Manager
GND	Ground
GOM	Ground Operations Manual
GPU	Ground Power Unit
GPWS	Ground Proximity Warning System
G/S	Glide Slope
GS	Ground Speed
HAA	Height Above Airport
HAT	Height Above Touchdown
HDG	Heading
HF	High Frequency (3-30 MHz)
HI	Hi Intensity
HIL	Hold Item List

HSI	Horizontal Situational Indicator
IAL	Instrument Approach and Landing Chart
IAS	Indicated Air Speed
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICE	Dry Ice
ID	Identity (number)
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
in	inch(es)
ISA	International Standard Atmosphere
ISO	International Standards Organization
JAA	Joint Aviation Authorities
KIAS	Knots Indicated Air Speed
Kg(s)	Kilogram
Km	Kilometres
KMH	Kilometres per Hour
KTS/kts	Knots
lb(s)	pound(s)
LCN	Load Classification Number
LD	Landing Distance
LDA	Landing Distance Available
LI	Low Intensity
LLZ	Localizer
LMC	Last Minute Changes
LOC/LLZ	Localizer
LOFT	Line Oriented Flight Training
LT	Local Time
LTC	Line training commander
3LTC	Three letter code
LVP	Low Visibility Procedures
LVTO	Low Visibility Take-off
mtr	Metric, meters
m	Mach
MAC	Mean Aerodynamic Chord
MAG	Magnetic
MAP	Missed Approach -Point
MAX/max	Maximum
MCD	Movable Curtain Divider
MDA	Minimum Descent Altitude
MDH	Minimum Descent Height
MEA	Minimum En-route IFR Altitude
MEL	Minimum Equipment List
MET	Meteorological
METAR	Aviation Routine Weather Report
MHz	Megahertz
MI	Medium Intensity (lights)
MIN/min.	Minimum
MLM	Maximum Landing Mass (Structural Limit)
MLS	Microwave Landing System
MME	Maintenance Management Exposition

MMEL	Master Minimum Equipment List
MNPS	Minimum Navigation Performance Specification
MOCA	Minimum Obstruction Clearance Altitude
MOE	Maintenance Organization Exposition
MORA	Minimum Off-Route Altitude
MRVA	Minimum Radar Vectoring Altitude
MSA	Minimum Sector Altitude
MSL	Mean Sea Level
MTBF	Minimum Time Between Failures
MTOW/M	Maximum Take-off Weight/Mass
MUH	Minimum Use Height
MZFW/M	Maximum Zero Fuel Weight/Mass
NAV	Navigation
NAVAID	Navigational Aid
NDB	Non Directional Beacon/Radio beacon
NFP	Net Flight Path
NIL	No Items Listed (Nothing)
NM	Nautical Miles
NOTAM	Notice to Airmen
NOTOC	Notification TO Captain
NSC	No Significant Clouds
NSW	No Significant Weather
OAT	Outside Air Temperature
OCA	Obstacle Clearance Altitude
OCH	Obstacle Clearance Height
OCL	Obstacle Clearance Limit
OFP	Operational Flight Plan
OFZ	Obstacle Free Zone
OM	Operations Manual
OPC	Operator Prof. Check
OPS	Operations
OTS	Organized Track System
OVC	Overcast
PACO	Pantry - cabin code
PANS	Procedures for Air Navigation Services
RAC	Rules of the Air
PANS/OPS	Procedures for Air Navigation Services - Airplane Operations
PAR	Precision Approach Radar
PBE	Crew Protective Breathing Equipment
PCN	Pavement Classification Number
PF	Pilot Flying
PM	Pilot Monitoring
PIC	Pilot in Command
PL	Payload
PNF	Pilot Non Flying
PNR	Point of No Return
PRM	Person with Reduced Mobility
QA	Quality Assurance
QDM	Magnetic Heading (Zero Wind)
QFE	Height Above Airport Elevation (Based on local station pressure)
QNH	Altitude Above Sea Level (Based on local station pressure)
QRH	Quick Reference Handbook

RA	Radio Altimeter
RAC	Air Traffic Routes and Services
RCLM	Runway Center Line Marking
REG	Registration
REIL	Runway End Identification Light
RL	Runway edge Lighting
RNAV	Area Navigation
RNP	Required Navigation Performance
RM	Route Manual (Part C)
RPL	Repetitive Flight Plan
RPM	Revolution per minute
RRW	Radioactive Material
RTOW/M	Regulated Take-off Weight (Mass)
RVR	Runway Visual Range
RWY	Runway
SAR	Search And Rescue
SAT	Static Air Temperature
SCD	Subject to Captains Discretion
SCT	Scattered
SELCAL	Selective Call System
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Report
SITA	Societee Internationale de Telecommunications Aeronautiques
SKC	Sky Clear
SNOWTAM	Snow Notice To Airmen
SOP	Standard Operating Procedures
SPECI	Special Report Amending a METAR
SRA	Surveillance Radar Approach
SRW	Short Runway
SSR	Secondary Surveillance Radar
STAR	Standard Terminal Arrival Route
STD	Standard
STPD	Standard Temperature Pressure Day
SVR	Slant Visual Range
TAF	Terminal/Aerodrome Forecast
TAS	True Air Speed
TCAS	Traffic Alert and Collision Avoidance System
TCU	Towering Cumulus
THR	Threshold
TL	Transition Level
TM	Training Manager
TMA	Terminal Manoeuvring Area
TOB	Total On Board
TOC	Top of Climb
TOD	Top of Descent
TODA	Take-off Distance Available
TOR	Take-off Run
TORA	Take-off Run Available
TOW/M	Take-Off Weight/Mass
TR	Temporary Revision
TRE	Type Rating Examiner
TRI	Type Rating Instructor

TWR	Tower (Aerodrome Control)
US	Unserviceable
U/S	Under Supervision
U/T	Under Training
UTC	Universal Time Coordinated
VFR	Visual Flight Rules
VHF	Very High Frequency (30-300 MHz)
VIS	Visibility
VMC	Visual Meteorological Conditions
VMO	Max. Operating Speed
VOR	VHF Omni directional Range
WX	Weather
ZFM	Zero Fuel Mass
ZFW	Zero Fuel Weight

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Навмисно залишена незаповненою

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1. LIMITATIONS

This chapter contains a description of certified limitations and the applicable operational limitations mentioned below.

The contents of the Limitations are resented in a form in which they can be without difficulty. The design of the Operations Manual observes Human Factors principles.

1.1. Certification Limitation

1.1.1. Certification Status

Aircompany aircrafts are certificated in the transport category for transport mail and freight according to requirements of CS-25 (FAR Part-25).

The aircraft is also certificated in compliance with the noise standards set out in ICAO Annex 16, Volume 1, Part II, Chapter 3 and CS-36 (FAR Part 36).

The aircraft complies with the Type Certificate No ТЛ 0002 issued by the State Aviation Administration of Ukraine.

The aircraft is modified in accordance with FAA Supplemental Type Certificate No SA2969SO (STC EASA.IM.A.S.02439) and SA2970SO (EASA.IM.A.S.02440) Freighter.

For details refer to respective AFM/FCOM and the AFM/FCOM Supplements.

Hereinafter in the text on this OM Part B AFM/FCOM means Boeing AFM/FCOM including the Supplements issued by STC holder (PEMCO) and approved by FAA.

1.1.2. Seating Configuration

Model:	Boeing 737-300
Crew:	• 1 Captain • 1 First Officer • Up to 2 cockpit observers

1.1.3. Approved Types of Operations

Aircompany`s aircrafts are certificated in Transport Category and is eligible for the following types of operation provided the appropriate instruments and equipment required are installed and in operable condition according to the minimum equipment list.

- Carriage of cargo.
- Operation in day and night Visual Meteorological Conditions (VMC)
- Operation in Instrument Meteorological Conditions (IMC)
- Flight in Icing condition
- Icing conditions
- CAT I (CAT II, CAT III and CAT IIIA when approved by the SAAU)
- RVSM operations
- BRNAV & PRNAV

1.1.4. Crew Composition

Detailed description of crew composition, is given in Aircompany`s OM Part A, Chapter 4. Minimum flight crew is given in AFM section limitations.

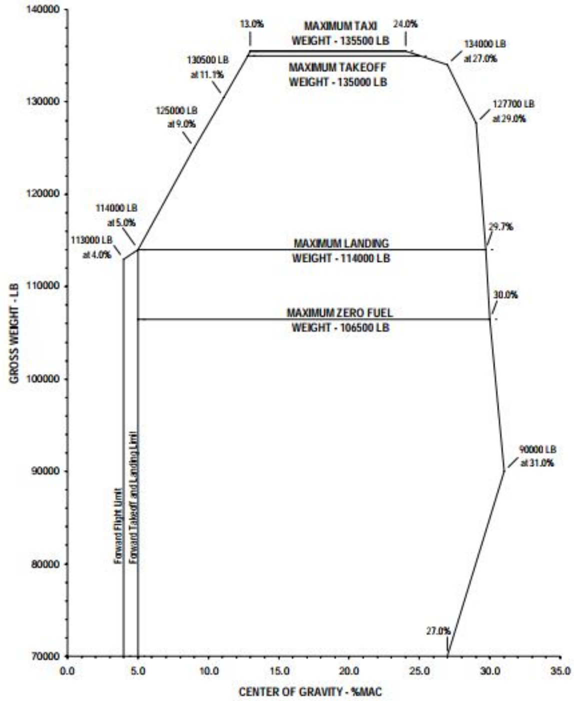
1.1.5. Mass and Centre of Gravity

Aviation Capital Group

CERTIFIED WEIGHT AND CENTER OF GRAVITY LIMITS (Continued)

C.G. LIMITS - MTW 135500 LB, MLW 114000 LB, MZFW 106500 LB

The following diagram represents the certified Center of Gravity Limits in English units:

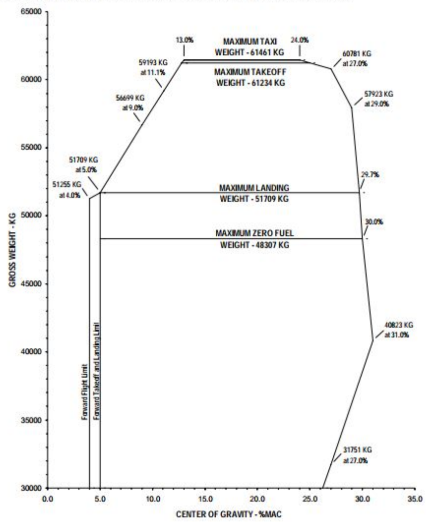


Center of Gravity

CERTIFIED WEIGHT AND CENTER OF GRAVITY LIMITS (Continued)

C.G. LIMITS - MTW 61461 KG, MLW 51709 KG, MZFW 48307 KG

The following diagram represents the certified Center of Gravity Limits in Metric units:



WARNING REFER TO PAGE 1 OF THIS SUBJECT FOR LIMITATIONS TO THE C.G. LIMITS.

1.1.6. Speed Limitations

1.1.6.1. Maximum Operating Speed (VMO) and Mach Number (MMO)

Reference: refer to AFM sec.1 p.8 / FCOM 10.40.6.

1.1.6.2. Maximum Design Maneuvering Speed VA

Reference: refer to AFM sec. 4.1 / QRH sec.PI-QRH. 10.3

1.1.6.3. Buffet Onset

Reference: refer to FCOM PD sec.11; AFM sec.4.1 p.8.A.

1.1.6.4. Minimum Control Speeds

Reference: refer to AFM sec.4.1.28; 4.7 p.3/ FCOM 10.40.8

1.1.6.5. Maximum Flaps / Slats Speeds

Reference: refer to AFM sec. 4.1 p14; p. 14A /QRH PI QRH. 10.3. /FCOM PI NP.21.34; NP.21.39

1.1.6.6. Gear Down Speeds

Reference: refer to AFM sec. 2 p.3 /QRH PI QRH 13.1 /FCOM PI 15.1.

1.1.6.7. Maximum Tire Speed

Reference: refer to AFM sec.4.6

1.1.6.8. Cockpit Window Open

Reference: refer to AFM sec. 3.2 /QRH sec. 1.26 / FCOM sec. 1.40.19.

1.1.6.9. Taxi Speed

Reference: refer to FCTM sec. 2.4 / FCOM sec.SP.16.21, 23

1.1.6.10. Stalling Speeds

Reference: refer to AFM 4.1. p. 27 / QRH 7.2. / FCOM 10.40.8; 15.20.6

1.1.7. Flight Envelope

1.1.7.1. Airport Limitations

Reference: Refer to AFM/FCOM sec. PD

1.1.8. Wind Limits including Operations on Contaminated Runways

1.1.8.1. Crosswind Limit

1.1.8.1.1. Takeoff Crosswind Component

The takeoff crosswind component is determined by entering the table below with RWY surface conditions code (RWYCC) assessed according to para 8.1.6.1.2 OM Part A.

Runway condition code (RWYCC)	Control / Braking Action	Crosswind Component (knots)
6	---	40
5	Good	25
4	Good to Medium	21
3	Medium	15
2	Medium to Poor	7
1	Poor	7
0	Nil	-

1.1.8.1.2. Landing Crosswind Component

The landing crosswind component is determined by entering the table below with RWY surface conditions code (RWYCC) assessed according to para 8.1.6.1.2 OM Part A.

Runway condition code (RWYCC)	Control / Braking Action	Crosswind Component (knots) (1)
6	---	40(3)
5(2)	Good	40(3)
4(2)	Good to Medium	35(3)
3(2)	Medium	20(3)
2(2)	Medium to Poor	17
1(2)	Poor	15
0(2)	Nil	-

Note: Reduce crosswind guidelines by 5 knots on wet or contaminated runways whenever asymmetric reverse thrust is used.

Notes:

(1) Winds measuring at 33 feet (10m) tower height and apply for runways 148 feet (45m) or greater width.

(2) Landing on untreated ice or snow should only be attempted when no melting is present.

(3) Sideslip only (zero crab) landings are not recommended with crosswind components in excess of 17 knots at flaps 15, 20 knots at flaps 30, or 23 knots at flaps 40. This recommendation ensures adequate ground clearance and is based on maintaining adequate control margin.

Reference: Refer to AFM sec. 4.1 /FCOM PD.10.1/ FCTM 4.74.

1.1.8.2. Tail Wind

Limiting tail wind component is 10 kts.

1.1.9. Performance Limitations for Applicable Configurations

Reference: Please refer to section 1.1.5.

The maximum allowable takeoff weight at the start of takeoff roll is limited by the most restrictive of the following:

1. Maximum certificated takeoff weight.
2. Maximum takeoff weight for altitude and temperature.
3. Maximum takeoff weight limited for maximum brake energy.
4. Maximum takeoff weight limited by tire speed.
5. Maximum takeoff weight for runway length available.
6. Maximum takeoff weight for obstacle clearance.

The maximum allowable landing weight is limited by the most restrictive of the following:

1. Maximum certificated landing weight.
2. Maximum landing weight limited by approach climb requirements.
3. Maximum landing weight for the runway length available.

1.1.10. Runway Slope

The maximum runway slopes approved for takeoff and landing are:

- +2.0% (Uphill)
- -2.0% (Downhill)

1.1.11. Limitations on Wet or Contaminated Runways

1.1.11.1. Standing Water and /or Slush

For operation in standing water and/or slush observe the following limitations: Both igniters on both engines must be on continuously for take-off and landing on runway surfaces covered with standing water, slush or snow or in icing conditions.

1.1.11.2. Operations on Contaminated Runways

Reference: Refer to AFM sec. 4.1 p.13 /FCOM sec. PD.12.

1.1.12. Airframe Contamination

1.1.12.1. Operation in Icing Condition

<u>Engine Anti-ice System.</u>

Turn engine ignition on prior to activating the engine anti-ice system. Turn ignition off after the engine anti-ice is turned off.

<u>Wing Anti-ice System</u>

In flight, the primary method of operating the wing anti-ice system is to operate it as a de-icing system. Ice accumulation on the cockpit window frames, windshield center post, or on the windshield wiper arm may be used as an indication of structural Icing Conditions and the need to turn on the wing anti-ice system.

<u>Window Heat</u>

Window heat must be ON to the No. 1 (FWD) and No. 2 (side) windows for all normal flight operations, and must be turned on to these windows 10 minutes prior to takeoff.

Airspeed is limited to 250 knots IAS at altitudes below 10,000 feet with any window heat inoperative.

NOTE: Window heat or the above airspeed restriction will provide maximum protection against bird strikes at any altitude where birds are likely to be encountered.

1.1.13. System Limitations

1.1.13.1. Air Conditioning / Pressurization and Vent System
Reference: Refer to respective FCOM sec.L10.4

1.1.13.2. Automatic Flight Control System
Reference: Refer to respective FCOM sec.L10.4.

1.1.13.3. Electrical Systems
Reference: Refer to respective FCOM sec.L10.5..

1.1.13.4. Flight Controls
Reference: Refer to respective FCOM sec.L10.7..

1.1.13.5. Fuel System
Reference: Refer to respective FCOM sec.L10.8..

1.1.13.6. Hydraulic
Reference: Refer to respective FCOM Ch.13.

1.1.13.7. Landing Gear
Reference: Refer to respective FCOM Ch.14.

1.1.13.8. Navigation
Reference: Refer to respective FCOM Ch.11 “Flight Management”, “Navigation”.

1.1.13.9. Oxygen
Reference: Refer to respective FCOM sec.PD 11, 13.

1.1.13.10. APU
Reference: Refer to respective FCOM sec.L 10.

1.1.13.11. Power Plant
Reference: Refer to respective FCOM sec.L 10..

1.2. Other Limitation
See other limitations that are not described in this OM Part B in Boeing AFM/FCOM and the Supplements issued by STC holder (PEMCO) and approved by FAA.

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2. NORMAL PROCEDURES

2.1. GENERAL

The contents of the Normal Procedures are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.

Normal Procedures is designed as phase of flight procedure for better complete picture on how normal flight performed from point (A) so (B). Aircompany`s normal procedures are as depicted in FCOMs and QRHs. Additions to and variations from this FCOM are outlined below. Where there is a contradiction the Aircompany`s procedure will be used.

2.1.1. Normal Procedures Philosophy and Assumption

Reference: refer to FCOM 11 “Normal Procedures”

2.1.2. Crew Concept

Each pilot must be able to function in a closely coordination manner with his partner. This “Crew Concept” is achieved through these essential elements:

- Cross-checking
- Communication (listening and sharing)
- Standardization

2.1.2.1. Crosscheck and Communication

As a general rule, any flight task or action performed by one Pilot should be verified or verifiable for error by the other Pilot.

In order to achieve a valid crosscheck, the “other pilot” must be aware that a change has been made. Make sure your partner knows when you make changes so that he will be able to cross-check your actions. In many instances the cross-check is achieved by proper use of Standard Callouts and the Normal Checklist.

In all cases adequate crosscheck must be accompanied by visual verification and may require verbal confirmation.

As a Aircompany`s policy and good practice physically pointing is required when new Altitude is set on MCP.

Some of important items that require crosscheck are:

- Transfer of control of the aircraft
- Aircraft configuration changes (landing gear, flaps, speed brakes)
- Altitude and Altimeters setting
- Airspeed and airspeed bug setting
- Heading and HDG Bug Setting
- Navigation Frequency and Course Selections/Indications, especially during the departure and approach phases of flight
- Navigation Fixes
- Changes to the Automated Flight Director System (AFDS)/ Flight Management System
- Performance calculation and inputs, including AFDS and FMS entries
- Fuel Quantity Indications including fuel balancing
- ATC clearance, instruction
- In addition, a cross-check by dual response before actuation of critical controls (i.e. thrust lever reduction of failed engine, start levers, fire warning switches, IDG/CSD disconnect switches, a flight control or spoiler switch) must be made.

To achieve this team goal, the crew must be of “one mind”. This requires clear and consistent communication.

Comply with the following principles:

- Communicate plans and intentions

  Both Pilots will clearly understand and agree with intended operation of aircraft. The PF is responsible for communicating the plan to the PM. The PM should never have to “mind read” the PF. The PM should have clear idea of the PF’s intentions at all times.
- Make informative callouts

  Informative callout is simple statement of a fact or condition that identifies a deviation from the plan. Speak up anytime you detect a developing trend away from standard procedures or stated intentions. As a rule, do not wait until you are uncomfortable with a situation to speak up. It more prudent to make callout than to assume that the PF will independently detect and correct the deviation.
- Verify Changes

  In most case, the Pilot performing a task need alert the other pilot of action. (Ex:”Anti-ice is ON”)
- Anytime one Pilot alters an aircraft system or moves a switch, the other Pilot needs to monitor/verify the change.

It requires that the Pilot changing parameters informs or communicates the change- allowing the other Pilot to verify the change (Ex: engaging autopilot)

- Clear-up areas of confusion

  If you become confused about the other Pilot's intention, clearance, procedures or situation speak up;

- Receives updates after temporarily leaving the ATC frequency

  If you need to leave the ATC frequency, inform the other Pilot. Ensure that the other Pilot is monitoring ATC. When you return, ensure that the other Pilot briefs you of any ATC changes that may have occurred;

- All clearance and communications shall be confirmed by both pilots. If either Pilot is uncertain about an ATC clearance, ask ATC to repeat it.

- Make necessary interventions

  The PM is the last line of defence against unsafe operation. Normally, the PM starts with an informative callout. If an adequate correction is not made and the time for a safe correction grows short, the PM may need to break the error chain. If the PF does not acknowledge the callout, fails to make an adequate correction, and/or failure is imminent, the PM will intervene. This intervention is dependent on the situation and may range from a forceful statement to taking control of the aircraft.

- Transfer of aircraft control

  Transfer of aircraft control must be concise and clear. There can be no doubts about who is controlling the aircraft. Therefore, when aircraft control is transferred, announce, "You have control". The Pilot assuming aircraft control will acknowledge, "I have control"

2.1.2.2. **Crew Resource Management (CRM)**

Crew resource management is the application of team management concept and the effective use of all available resources to operate a flight safety. In addition to aircrew, it includes all other groups routinely working with aircrew who are involved in decisions required to operate a flight. These groups include, but are not limited to, aircraft dispatchers, maintenance personnel and air traffic controllers.

Throughout this manual, techniques that help build good CRM habit patterns on the flight deck are discussed. For example, situation awareness and communications are stressed. Situation awareness or the ability to accurately perceive what is going on in the flight deck and outside the aircraft, requires ongoing questioning, crosschecking, communication and refinement of perception.

It is important that all flight deck crewmembers identify and communicate any situation that appears unsafe or out of ordinary. Experience has proven that the most effective way to maintain safety and resolve these situations is to combine the skill and experience of all crewmembers in the decision making process to determine the safest course of action.

2.1.2.3. **Flow Patterns and Checklist Usage**

Routine flight operations can be successfully achieved thought the application of Normal Checklist Philosophy. This philosophy depends on the use of the appropriate Flow Patterns and Challenge/Response checklist.

Each phase of flight requires certain actions which are accomplished from memory using a panel scan flow as described in each FLOW PATTERN description. The flow generally follows a top-down, left-right pattern. The checklist should be read when called for, but the checklist reader will remind his partner if he feels the request for it is overdue. After the appropriate Flow Pattern(s) have been accomplished, the Challenge/Response method will be used to complete the Normal checklist to prevent CRITICAL omissions.

Both pilots are responsible for checking and visual verification of each checklist items.

When a disagreement between the response and checklist answer occurs, it is mandatory that the checklist be discontinued:

- stop checklist, complete the respective procedure step, continue the checklist

If it becomes apparent that an entire procedure was not done:

- stop checklist, complete the entire procedure, do the checklist from the start

Try to do checklist before or after high workloads time. The crew may need to stop a checklist for a short time to do other tasks. If interruption is short, continue the checklist with the next step.

Do the checklist from the start:

- if checklist is stopped for a long time
- if a Pilot is not sure where the checklist was stopped
- if Both Pilots become distracted

When reading the checklist step, "Recall", press and release your system annunciator panel.

When both pilots are required to give response, the Pilot which reads the checklist responds second.

After completion of each checklist, the Pilot reading the checklist calls, "CHECKLIST COMPLETED"

Note: Normal checklists are not "TO DO" lists. The flight crew should have performed the actions, or checks, prior to going through the checklist. The flight crew must take corrective action on any item that is not in the proper condition, when the list is read.

2.1.3. Standard Callouts

Both crewmembers should be aware of altitude, airplane position and situation.

Avoid nonessential conversation during critical phases of flight, particularly during taxi, takeoff, approach and landing. Unnecessary conversation reduces crew efficiency and alertness and is not recommended when below 10,000 feet MSL / FL100. At high altitude airports, adjust this altitude upward, as required.

Recommended callouts are provided in the interest of good CRM. Developed by Aircompany callouts are provided in this manual. However, procedural callouts found in this list should be accomplished as indicated in the Procedures section of the FCOM.

The Pilot Monitoring (PM) makes callouts based on instrument indications or observations for the appropriate condition. The Pilot Flying (PF) should verify the condition/location from the flight instruments and acknowledge. If the PM does not make the required callout, the PF should make it.

The PM calls out significant deviations from command airspeed or flight path. Either pilot should call out any abnormal indications of the flight instruments (flags, loss of deviation pointers, etc.).

One of the basic fundamentals of Crew Resource Management is that each crewmember must be able to supplement or act as a back-up for the other crewmember. Proper adherence to recommended callouts is an essential element of a well-managed flight deck. These callouts provide both crewmembers required information about airplane systems and about the participation of the other crewmember. The absence of a callout at the appropriate time may indicate a malfunction of an airplane system or indication, or indicate the possibility of incapacitation of the other pilot.

The PF should acknowledge all GPWS voice callouts except altitude callouts during approach while below 500 feet AFE. The recommended callout of “CONTINUE” or “GO-AROUND” at minimums is not considered an altitude callout and should always be made. If the automatic electronic voice callout is not heard by the flight crew, the PM should make the callout. No callout is necessary from the PM if the GPWS voice callout has been acknowledged by the PF.

Note: If automatic callouts are not available, the PM shall call out radio altitude at 100 feet, 50 feet and 30 feet (or other values as required) to aid in developing an awareness of eye height at touchdown.

ALL PILOTS SHALL STRICTLY ADHERE TO ALL "STANDARD CALLOUTS"

	CONDITION / LOCATION	CALLOUT (Pilot Monitoring, unless noted)
Climb and Descent	Approaching Transition Altitude	“TRANSITION ALTITUDE, SET STANDARD”
	Approaching Transition Level	“TRANSITION LEVEL, SET QNH ______” (in. or mb)
	1,000 ft. above/below assigned altitude/Flight Level (IFR)	“1,000 TO LEVEL OFF”
Descent	10,000 ft. MSL / FL100 (Reduce airspeed if required) (IFR and VFR)	“10,000 FEET” or “FLIGHT LEVEL 100”

ILS or GLS Approach	
First positive inward motion of localizer pointer	“LOCALIZER ALIVE”
Final approach fix inbound	“OUTER MARKER/FIX, ___FEET”
1,000 ft. AFE	“1,000 FEET”
500 ft. AFE (Check autoland status annunciator, if applicable)	“500 FEET” (F/D or single autopilot approach) Autoland status “FLARE ARMED” (Autoland callout only)
100 ft. above DA(H) (fail passive airplanes)	“APPROACHING MINIMUMS”
Individual sequence flasher lights visible	“STROBE LIGHTS”
At AH (fail operational airplanes) – check autoland status annunciator	“ALERT HEIGHT”
At DA(H) with individual approach light bars visible	“MINIMUMS – APPROACH LIGHTS / RED BARS” (if installed)
At DA(H) - Suitable visual reference established, i.e., PM calls visual cues	PF: “CONTINUE”
At DA(H) - Suitable visual reference not established, i.e., PM does not call any visual cues or only strobe lights	PF: “GO AROUND”
At minimums callout - If no response from PF	“I HAVE CONTROL______” (state intentions)
Below DA(H) - Suitable visual reference established	“THRESHOLD/RUNWAY TOUCHDOWN ZONE”
Below DA(H) - Suitable visual reference established	PF: “LANDING”
Below DA(H) - Suitable visual reference not established, i.e., PM does not call any visual cues	PF: “GO AROUND”

Non-ILS or Non-GLS Approach	
First positive inward motion of VOR or LOC course deviation indication	“COURSE/LOCALIZER ALIVE”
Final approach fix inbound	“VOR/NDB/FIX, ___FEET”
1,000 ft. AFE	“1,000 FEET”
500 ft. AFE	“500 FEET”
100 ft. above DA(H) or MDA(H)	“APPROACHING MINIMUMS”
Individual sequence flasher lights visible	“STROBE LIGHTS”
At DA(H) or MDA(H) with individual approach light bars visible	“MINIMUMS – APPROACH LIGHTS / RED BARS” (if installed)
At DA(H) or MDA(H) - Suitable visual reference established, i.e., PM calls visual cues	PF: “CONTINUE”
At DA(H) or MDA(H)- Suitable visual reference not established, i.e., PM does not call any visual cues or only strobe lights	PF: “GO AROUND”
At minimums callout - If no response from PF	“I HAVE CONTROL______” (state intentions)
Below DA(H) or MDA(H)- Suitable visual reference established	“THRESHOLD/RUNWAY TOUCHDOWN ZONE”
Below DA(H) or MDA(H)- Suitable visual reference established	PF: “LANDING”
Below DA (H) or MDA(H)- Suitable visual reference not established, i.e., PM does not call any visual cues	PF: “GO AROUND”

STANDARD PHRASEOLOGY

A partial list of standard words and phrases follows:

- Thrust:
  – “SET TAKEOFF THRUST”
  – “SET GO-AROUND THRUST”
  – “SET MAXIMUM CONTINUOUS THRUST”
  – “SET CLIMB THRUST”
  – “SET CRUISE THRUST”
- Flap Settings:
  – “FLAPS UP”
  – “FLAPS ONE”
  – “FLAPS FIVE”
  – “FLAPS TEN”
  – “FLAPS FIFTEEN”
  – “FLAPS TWENTY-FIVE”
  – “FLAPS THIRTY”
  – “FLAPS FORTY”
- Airspeed:
  – “SET _____ KNOTS”
  – “SET VREF PLUS (additive)”
  – “SET FLAPS _____ SPEED”

2.1.4. Checklist Introduction

- Aircompany Normal Checklist shall always be used.
- ON ground the commander will call for the checklist and the co-pilot shall read it.
- In the air (PF) will call for the checklist and (PNF) shall read it.

2.1.5. **Normal Checklist**

CONSTANTA Boeing 737-300 Normal Checklist UR-UAA

PREFLIGHT	
Oxygen……………………………**Tested, 100%**	BOTH
Instrument Transfer Switches………**NORMAL**	FO
Window Heat………………………………**ON**	FO
Pressurization Mode Selector…………**AUTO**	
Flight Instrument..**Heading**___, **Altimeter**___.	BOTH
Parking Brake…………………………………**Set**	
Engine Start Levers……………………**CUTOFF**	
Landing Gear.**DOWN,2 GREEN(SECONDARY)**	FO
Smoke Detectors…………………**CHECKED**	FO
Cargo Door Warning………………**CHECKED**	FO
BEFORE START	
Flight Deck Door…………**Closed and locked**	FO
Fuel……………………_____ LBS, **Pumps ON**	FO
Passenger Signs………………………_____.	FO
Windows……………………………………**Locked**	BOTH
MCP………**V2**__, **HEADING**__, **ALTITUDE**__.	BOTH
Takeoff Speed……**V1** ___, **VR** ___, **V2** ___.	BOTH
CDU Preflight……………………………**Completed**	BOTH
Rudder and Aileron Trim…………**Free and 00**	CMD
Taxi and Takeoff Briefing…………**Completed**	CMD
Anti Collision Light………………………………**ON**	FO
BEFORE TAXI	
Generators…………………………………………**ON**	FO
Pitot Static Heat……………………………………**ON**	FO
Anti-ice…………………………………………_____.	FO
Isolation Valve……………………………………**AUTO**	FO
Engine Start Switches……………………**CONT**	FO
Recall……………………………………………**Checked**	BOTH
Autobrake…………………………………………**RTO**	FO
Engine Start Levers………………**IDLE detent**	CMD
Flight Controls……………………………**Checked**	FO
Ground Equipment & Personnel…………**Clear**	BOTH
BEFORE TAKEOFF	
Flaps…………………………_______, Green light	CMD
Stabilizer Trim……………………_______ Units	CMD
Transponder…………………………………**TA/RA**	CMD

AFTER TAKEOFF	
Engine bleeds…………………………………………**ON**	PM
Packs……………………………………………**AUTO**	PM
Landing gear……………………………**UP and OFF**	PM
Flaps……………………………………**UP, No lights**	PM
DESCENT	
Pressurization……………………………LAND ALT	PM
Recall…………………………………………**Checked**	BOTH
Autobrake……………………………………_______.	PM
Landing Data………**VREF**___, **Minimums**___.	BOTH
Approach Briefing……………………**Completed**	PM
APPROACH	
Altimeters…………………………………………____.	BOTH
LANDING	
Engine Start Switches……………………**CONT**	PF
Speedbrake………………………………**ARMED**	PF
Landing Gear……………………………………**Down**	PF
Landing Gear..**Down 2GREEN(SECONDARY)**	PF
Flaps…………………………_____, Green light	PF
SHUTDOWN	
Fuel Pumps…………………………………………**OFF**	FO
Pitot static Heat……………………………**AUTO**	FO
Hydraulic Panel…………………………………**Set**	FO
Flaps…………………………………………………**UP**	FO
Parking Brake……………………………………___.	CMD
Engine Start Levers……………………**CUTOFF**	CMD
Weather Radar……………………………………**Off**	FO
Transponder……………………………**STANDBY**	FO
BEFORE MAIN CARGO DOOR OPERATION	
Fuel…………………**MINIMUM 250 GALLONS** **(NO. 2 TANK)**…………**(1675 LBS/760 KG)** **(2 MINUTE HYD SYS B EMDP OPERATION)**	FO
SECURE	
IRSs………………………………………………**OFF**	FO
Emergency Exit Lights…………………………**OFF**	FO
Window Heat……………………………………**OFF**	FO
Packs………………………………………………**OFF**	FO

CONSTANTA Boeing 737-300 Normal Checklist UR-UAA

No Engine Bleed Takeoff and Landing

When making a no engine bleed takeoff or landing with the APU operating.

Takeoff

Note: If anti–ice is required for taxi, configure for a "No Engine Bleed Takeoff" just prior to takeoff.

Note: If anti–ice is not required for taxi, configure for a "No Engine Bleed Takeoff" just after engine start.

Right PACK switch ....AUTO
ISOLATION VALVE switch ....CLOSE
Left PACK switch ....AUTO
Engine No. 1 BLEED air switch ....OFF
APU BLEED air switch ....ON
Engine No. 2 BLEED air switch ....OFF
WING ANTI-ICE switch ....OFF

The WING ANTI-ICE switch must remain OFF until the engine BLEED air switches are repositioned to ON and the ISOLATION VALVE switch is repositioned to AUTO.

After Takeoff

Note: If engine failure occurs, do not position engine BLEED air switches ON until reaching 1500 feet or until obstacle clearance height has been attained.

Engine No. 2 BLEED air switch ....ON
APU BLEED air switch ....OFF

When CABIN rate of CLIMB indicator stabilizes:

Engine No. 1 BLEED air switch ....ON
ISOLATION VALVE switch....................AUTO

Landing

If additional go-around thrust is desired configure for a "No Engine Bleed Landing."

When below 10,000 feet:

WING ANTI-ICE switch ....OFF
Right PACK switch ....AUTO
ISOLATION VALVE switch ....CLOSE
Left PACK switch....................AUTO
Engine No. 1 BLEED air switch ....OFF
APU BLEED air switch ....ON
Engine No. 2 BLEED air switch ....OFF

Starting with Ground Air Source (AC electrical power available)

Engine No. 1 must be started first.

When cleared to start:

APU BLEED air switch ....OFF
Engine No. 1 start ....Accomplish

Use normal start procedures.

WARNING: To minimize the hazard to ground personnel, the external air should be disconnected, and engine No. 2 started using the Engine Crossbleed Start procedure.

Engine Crossbleed Start

Do not accomplish a crossbleed start during pushback. Before using this procedure, ensure that the area to the rear is clear.

Engine BLEED air switches....................ON
APU BLEED air switch ....OFF
PACK switches ....OFF
ISOLATION VALVE switch ....AUTO

Ensures bleed air supply for engine start.

Engine thrust lever (operating engine).....Advance thrust lever until bleed duct pressure indicates 30 PSI

Non–operating engine.................... Start

Use normal start procedures with crossbleed air.

After starter cutout, adjust thrust on both engines, as required.

Electrical Power Up

The following procedure is accomplished to permit safe application of
electrical power.

BATTERY switch ....Guard closed
STANDBY POWER switch ....Guard closed
ALTERNATE FLAPS master switch ....Guard closed
Windshield WIPER selector ....OFF
ELECTRIC HYDRAULIC PUMPS switches ....OFF
LANDING GEAR lever ....DN

Verify that the green landing gear indicator lights are illuminated.
Verify that the red landing gear indicator lights are extinguished.

WEATHER RADAR ....Off

If external power is needed:

Verify that the GRD POWER AVAILABLE light is illuminated.

GRD POWER switch ....ON

Verify that the BUS OFF lights are extinguished.
Verify that the TRANSFER BUS OFF lights are extinguished.
Verify that the STANDBY PWR OFF light is extinguished.

If APU power is needed:

Verify that the engine No. 1, APU and the engine No. 2 fire switches are in.

Alert ground personnel before the following test is accomplished.

OVHT DET switches....................NORMAL
TEST switch ....Hold to FAULT/INOP

Verify that the MASTER CAUTION lights are illuminated.
Verify that the OVHT/DET annunciator is illuminated.
Verify that the FAULT light is illuminated.
If the FAULT light fails to illuminate, the fault monitoring system is inoperative.
Verify that the APU DET INOP light is illuminated.
Do not run the APU if the APU DET INOP light does not illuminate.

TEST switch....................Hold to OVHT/FIRE

Verify that the fire warning bell sounds.
Verify that the master FIRE WARN lights are illuminated.
Verify that the MASTER CAUTION lights are illuminated.
Verify that the OVHT/DET annunciator is illuminated.

Master FIRE WARN light ....Push

Verify that the master FIRE WARN lights are extinguished.
Verify that the fire warning bell cancels.
Verify that the engine No. 1, APU and the engine No. 2 fire switches stay illuminated.
Verify that the ENG 1 OVERHEAT and ENG 2 OVERHEAT lights stay illuminated.

Extinguisher test switch ....Check
TEST switch ....Position to 1 and hold

Verify that the three green extinguisher test lights are illuminated.

TEST switch ....Release

Verify that the three green extinguisher test lights are extinguished.
Repeat for test position 2.

APU ....Start

Note: If extended APU operation is needed on the ground and the airplane busses are powered by AC electrical power, position an AC powered fuel pump ON. This will extend the service life of the APU fuel control unit.

Note: If fuel is loaded in the center tank, position the left center tank fuel pump switch ON to prevent a fuel imbalance before takeoff.

CAUTION: Center tank fuel pump switches should be positioned ON only if the fuel quantity in the center tank exceeds 1000 lbs.

CAUTION: Do not operate the center tank fuel pumps with the flight deck unattended.

When the APU GEN OFF BUS light is illuminated:

APU GENERATOR bus switches ....ON

Verify that the BUS OFF lights are extinguished.
Verify that the TRANSFER BUS OFF lights are extinguished.
Verify that the STANDBY PWR OFF light is extinguished.
Verify that the APU MAINT light is extinguished.
Verify that the APU LOW OIL PRESSURE light is extinguished.
Verify that the APU FAULT light is extinguished.
Verify that the APU OVER SPEED light is extinguished.

Wheel well fire warning system ....Test
Test switch....................Hold to OVHT/FIRE

Verify that the fire warning bell sounds.
Verify that the master FIRE WARN lights are illuminated.
Verify that the MASTER CAUTION lights are illuminated.
Verify that the OVHT/DET annunciator is illuminated.

Fire warning BELL CUTOUT switch ....Push

Verify that the master FIRE WARN lights are extinguished.
Verify that the fire warning bell cancels.
Verify that the WHEEL WELL light stays illuminated.

Electrical Power Down

This procedure assumes the Secure procedure is complete

If APU was operating:

It is recommended that the APU be operated for one full minute with
no pneumatic load prior to shutdown.

APU switch and/or GRD POWER switch ....OFF

If APU was operating:

Delay approximately 20 seconds after APU shutdown for the APU door to close to assure the APU will start on the next flight.

BATTERY switch ....OFF

2.1.6. Focused Flight Deck

Below 10,000 ft, any non-essential conversation within the cockpit and between the cabin and cockpit crews should be avoided.

Since several major accidents have been caused by distraction of flight deck crew during critical phases of flight, the Company deems it necessary to be very strict in defending and using the Sterile cockpit concept. Normally the flight deck crew shall never be disturbed BELOW 10,000 (10 min after takeoff and before landing), except for standard messages from CC.

During critical phases of flight, no visits or interphone calls to flight deck by CC`s or others are permitted, except in safety matters. Critical phases in this respect include:

- Ground operation, such as engine start up (push back)
- Ground operation such as taxi
- Below 10,000 ft, 10 min after takeoff and before landing

a) Flight crew activities

When sterile flight crew compartment procedures are applied, flight crew members are focused on their essential operational activities without being disturbed by non-safety related matters.

Examples of activities that should not be performed are:

a. radio calls, fuel loads, catering, etc.;
b. non-critical paperwork; and
c. mass and balance corrections and performance calculations, unless required for safety reasons.

b) Communication to the flight crew

Flight crew use their own discretion to determine whether the situation is related to safety or security matters and whether to call the flight crew. Situations requiring information to the flight crew may include:

a. any outbreak of fire inside the cabin or in an engine;
b. a burning smell in the cabin or presence of smoke inside or outside;
c. fuel or fluid leakage;
d. exit door unable to be armed or disarmed;
e. localised extreme cabin temperature changes;
f. evidence of airframe icing;
g. cabin/galley equipment or furniture malfunction/breakage posing a hazard to the occupants;
h. suspicious object;
i. security threat;
j. abnormal vibration or noise;
k. medical emergency;
l. general drop-down of the oxygen masks in the cabin

2.1.7. Configuration Check

It is the crew member's responsibility to verify correct system response. Before engine start, use system lights to verify each system's condition or configuration. After engine start, the master caution system alerts the crew to warnings or cautions away from the normal field of view. If there is an incorrect configuration or response:

- verify that the system controls are set correctly
- check the respective circuit breaker as needed. Maintenance must first determine that it is safe to reset a tripped circuit breaker on the ground
- test the respective system light as needed

Before engine start, use individual system lights to verify the system status. If an individual system light indicates an improper condition:

- check the Minimum Equipment List (MEL) to decide if the condition has a dispatch effect
- decide if maintenance is needed

If, during or after engine start, a red warning or amber caution light illuminates:

- do the respective non-normal checklist (NNC)
- on the ground, check the MEL

If, during recall, an amber caution illuminates and then extinguishes after a master caution reset:

- check the MEL
- the respective non-normal checklist is not needed

2.1.8. Crew Duties and Responsibilities

Preflight and post flight crew duties are divided between the Commander and first officer. Phase of flight duties are divided between the Pilot Flying (PF) and the Pilot Monitoring (PM).

Each crewmember is responsible for moving the controls and switches in their area of responsibility:

- The phase of flight areas of responsibility for both normal and non-normal procedures is shown in the Area of Responsibility illustrations in this section. Typical panel locations are shown.
- The preflight and post flight areas of responsibility are defined by the "Preflight Procedure - Commander" and "Preflight Procedure - First Officer".

The Commander may direct actions outside of the crewmember's area of responsibility.

The general PF phase of flight responsibilities are:

- Taxiing (Commander only)
- Flight path and airspeed control
- Airplane configuration
- Navigation
- Strives maneuver the aircraft smoothly (smooth control flight inputs and thrust setting)
- Strives to conduct the flight for optimum performance
- Communicate the plan.

For normal operations, FCOM procedures will be used as the plan. When conditions dictate a change, that change must be clearly stated by the PF, and must conform to operational priorities.

The Commander is responsible for guiding the crewmembers involved in the plan. During each phase of the flight, the crew will work together to form, execute, monitor and alter the plan, as conditions require.

- Perform necessary weather avoidance

Before altering course or altitude for weather, the PF will communicate the weather avoidance plan with the PM.

The general PM phase of flight responsibilities are:

- Checklist reading
- Communications
- Tasks asked for by the PF
- Monitoring taxiing, flight path, airspeed, airplane configuration, and navigation
- Paperwork
- Ensure safety

Speak up anytime you detect a developing trend away from standard procedures or stated intentions. This is in addition to required deviations callout. The standard for speaking-up is deviation, not personal comfort level. As a rule, do not wait until you are uncomfortable with a situation to speak up

- Assist the PF

The PM actively assists the PF to safely and professionally complete the flight. The PM is guided by the standards. “What can I do to assist the PF in planning and executing this flight?” The PM thinks ahead to anticipate planning and information needs.

- Improve Situational Awareness

The PM works to improve the crew’s level of situational awareness. This involves acquiring information, communicating options, and assisting the PF in building and executing the plan.

- Answer Flight Attendant service interphone calls

2.1.9. Control Display Unit (CDU) Procedures

Reference: refer to FCOM ”Normal Procedures” 11.3

2.1.10. Autopilot Flight Director System (AFDS) Procedures

Reference: refer to FCOM ”Normal Procedures” 11.4

2.1.11. Scan Flow and Areas of Responsibility

Reference: refer to FCOM ”Normal Procedures” 11.4

2.1.12. Radiotelephony and Transponder Setting Procedures

2.1.12.1. Language to be Used

The air-ground radiotelephony communications shall be conducted in the Official ICAO languages (English).

2.1.12.2. Standard Radio Phraseology

All pilots shall use standard radio phraseology when communicating with ATC, to include, as a minimum, instructions for:

- clearance acceptance and read-back;
- use of call sign.

In order to avoid any possible confusion, when issuing ATC clearances and reading back such clearances, pilots shall always add the call sign of the aircraft to which the clearance applies.

Read back procedure (to ensure confirmation between both pilots):

- Commander normally requests the F/O to obtain an ATC clearance before engine start.

The ATC clearance may be obtained earlier at the discretion of the Commander. At airports that issue clearance during taxi, the F/O will ensure the Commander is monitoring when resetting NAV radios if necessary and when resetting the MCP altitude alert and transponder. When ATC clearance has been received, the PF will, if necessary, revise the briefing according to the clearance, including SID routing, restrictions etc.

- ATC route clearances shall always be read back unless otherwise authorized by the appropriate ATS authority, in which case they shall be acknowledged in a positive manner.
- All clearances or instructions, including conditional clearances, shall be read back or acknowledged in a manner to clearly indicate that they have been understood and will be complied with.
- Runway-in-use, altimeter settings, SSR Codes, flight level or altitude (height) instructions, heading and speed instructions and, where so required by the appropriate ATS authority, transition levels, shall always be read back. It is essential important in areas of high terrain.
- All clearances to enter, land on, take off on, cross and backtrack on the runway-in-use, instruction for holding short of the runway shall be read back.

If any doubt between two pilots is exist - ATS clearance shall be re-obtained and reconfirmed accordingly.

Altitude reporting after takeoff

After airborne with frequency change after takeoff pilots should include passing altitude information in their reports to ATS for clear aircraft identification, unless another communication procedure is used or requested by ATC.

2.1.13. **Policies on Headphone and Flight Deck Speaker Use, VHF and HF Communication Radios**

2.1.13.1. **Use of Headphones**

Each pilot must be in possession of a boom mike type headset. In the airplane headphones or boom microphones/headsets are worn during take-off until the top of climb and from the start of descent throughout approach and landing.

The use of headset when both VHF communications radio are being used simultaneously or the interphone or PA is being used will ensure a proper listening watch is maintained on primary VHF frequency due to volume degradation.

2.1.13.2. **Flight Deck Speakers**

When pilot(s) are seated in the cockpit at the gate/stand the Commander should have his/her flight interphone audio and speaker selected (if headset not ON) in order that a ground staff can easily speak to him at any time from external flight interphone position.

In the airplane, headphones or boom microphones/headsets are worn during take-off until the top of climb and from the start of descent throughout approach and landing. During cruise, flight deck speakers may be used. Speaker volume should be kept at the minimum usable level adequate to avoid interference with normal crew flight deck conversation, but still assure reception of relevant communications.

2.1.13.3. **Use of VHF, HF Communication Radios**

The VHF radio should be selected ON during cockpit preparation and proper frequencies selected. №1 VHF radio is used as a primary for ATC communication, №2 VHF will be the secondary radio and set to 121,5 for a listening watch except when needed for routing communications (Company, ATIS, weather checks, etc.).

On the ground when at the gate/stand the pilots will monitor Company frequency for messages.

Prior to top of descent pass information to destination company /handling company.

2.1.13.4. **Radio Duties**

If the F/O is the PF, his/her last radio call will be “Cleared for takeoff” call. Thereafter the Commander will be operating the radio.

After landing the F/O will communicate with ATC only after the aircraft control has been transferred to the Commander.

The PF will always remain on ATC №1 VHF so as to be able to react immediately to ATC instructions or clearance revisions.

The PM will operate №2 VHF on request of PF or as required. When it is necessary for one pilot to leave the ATC frequency to use the second radio, he will advise that he is OFF the frequency (ATC) and when he is back ON.

The PF will brief the PM about any changes on ATC frequency, instructions, clearance.

2.1.14. **Transponder Setting Procedures**

2.1.14.1. **Introduction**

New Procedure is to be used in all European airports. Airport equipment is using the Mode S transponder to improve the accuracy and the reliability of the ground moving monitoring system.

2.1.14.2.**Procedure to be Applied by Pilots**

When moving onto the movement area check the aircraft Mode S transponder for correct operation:

1. For outbound taxing aircraft, before requesting the push bask or taxing clearance from an aircraft stand;
   - Enter, using the FMS or the transponder control unit:
     Enter flight identification as specified in the ICAO flight plan or in the absence of flight identification, the aircraft registration.
   - Select XPNDR or its equivalent with respect to specification of the installed model;
   - Do not select OFF or STBY functions;
   - Set the Mode A code assigned by the controller;
2. For inbound taxing aircraft: after landing until stopping at the aircraft stand:
   - Select XPNDR or its equivalent with respect to specification of the installed model;
   - Do not select OFF or STBY functions;
   - Maintain the Mode A code assigned by the controller;
3. Other Cases of aircraft moving onto the movement area:
   - Select XPNDR or its equivalent with respect to specification of the installed model;
   - Do not select OFF or STBY functions;
   - Set the Mode A code TO 2000.

2.1.15. **Use of Aircraft Lighting**

2.1.15.1.**Strobe/Position Lights**

Position lights (Steady) will be selected on:

- on the ground at any time when there is an operation personnel or crew on an airplane with the purpose of flight preparation.
- for all flights

2.1.15.2.**Strobe Lights**

Strobe lights (Strobe and Steady) will be selected on

- when cleared to enter the active runway, and will remain on until vacating the active runway.
- For backtrack purposes the strobe will be left on.

Note: During low visibility approaches and when in clouds, if reflection of the strobes causes in deterioration of outside cockpit view and distraction it is recommended to switch them off.

2.1.15.3.**Anti-Collision Light**

The anti-collision light will be selected on:

- prior to engine start/pushback and turned off when N1 decreases below 10% on both engines' shutdown.

2.1.15.4.**Taxi Light (as installed)**

The taxi light will be selected on:

- when taxi clearance has been received

Note: When instructed or required to hold position the taxi light will be turned off until commencement of taxi.

2.1.15.5.**Runway Turn Off Lights**

Runway turn off lights will be selected on:

- when taxi clearance has been received.

Note: When instructed or required to hold position they will be turned off until commencement of taxi.

Note: They should be switched off when passing FL100 (10,000 ft) in the climb. During descent passing FL100 (10,000 ft) select the turn off lights on.

2.1.15.6.**Inboard Landing Lights**

Inboard Landing lights will be selected on:

- When cleared to enter the active runway.
- They will remain on until passing FL100 (10,000 ft) in the climb.
- During descent passing FL100 (10,000 ft) select the landing lights on and leave them on until the runway is vacated.
- For backtrack purposes leave landing lights on.

2.1.15.7. Outboard Landing Lights

Outboard Landing lights should be used:

At Commander's discretion, except when a bird hazard is reported or may exist, and then their use becomes mandatory.

It should be noted that due to extra drag, the Outboard Landing lights should be switched off after Flaps Up or once bird activity areas has been cleared.

At the Commander's discretion, the Outboard Landing lights may be switched on during the approach phase. Position of Outboard landing lights is additional method of situation awareness. Select the lights on when cleared to land or at 500 ft latest.

Vacating the runway switch them off.

During low visibility approaches and when in clouds usually, it is not recommended to use landing lights. Use of landing lights can result in deterioration of outside cockpit view. Reflected light from rain or fog droplets can result in significant visibility reduction.

2.1.15.8. Wing Lights

The wing lights are recommended to be on in darkness below FL100.

2.1.15.9. Logo Lights (as installed)

Logo lights (as installed) are recommended to be on in darkness below FL100.

2.1.15.10. Wheel Well Lights

Wheel well lights at nights or in low visibility, select the wheel well lights on in preparation for walkaround. On return to the cockpit after completing the walkaround the lights should be switched off.

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2.2. PRE–FLIGHT

2.2.1. General

The pre-flight preparation procedures begin with reporting to duty of all flight crew members about 1 hour before ETD After collecting all necessary information, commander initiates

Dispatch Briefing with all flight crew members present. Dispatch briefing will include:

Weather Briefing:

a. Actual and valid forecast weather conditions for destination, alternate and en-route airports,

b. En-route significant weather, winds and temperature charts.

Airplane status, verify the technical status of the airplane in respect to:

a) Airworthiness of airplane,

b) Acceptability of malfunctions (MEL, CDL) and influence on the flight plan, or approach procedures.

Flight plans:

a. Routing, altitudes, fuel and timings,

b. Estimated load figures, (payload, fuel load), and

c. ATC flight plan and restrictions,

d. Company commercial alternates,

e. Airport closure times for destination and alternates.

NOTAMS:

a) NOTAMS, provided by Flight Dispatcher, shall be examined for changes of routings, NAVAID unserviceability, runway and approach availability etc, which may have an impact on the final fuel requirement,

b) The Jeppesen charts NOTAMS and Flight Dispatch may need to be referred too.

Publications (Pilot Bulletin, Technical Information, etc.).

Duties in addition to those specified in adequate OMs, SOPs and other directives.

2.2.2. FLIGHT CREW Briefing in OCC

During pre-flight preparation in OCC, Commander will brief flight crew according to the checklist below.

Checklist
• Security considerations. • Flight deck entry/exit procedure. • Planned flight time/altitude. • En route/destination weather (include level of en route turbulence and time expected, if known). • Extra Crew Members (XCMs). • Seat belt/no smoking sign use. • Review of cabin discrepancies.

2.2.3. Procedures for the Use of Vacant Crew Seats

Flight Deck Observer Seats

Travel on the flight deck observer seat can cause significant distraction and/or interference with the safety of the flight. Therefore, the following rules apply:

- If the Commander anticipates high workload e.g., due to external threats, such as low visibility operations, Aircraft dispatched according MEL, heavy traffic, etc. travel on flight deck observer seats is prohibited except for entitled persons.
- If the above is not a factor and all Flight Crew Members have been consulted, travel on a flight deck observer seat is allowed provided that the person travelling on the flight deck has shown his ID prior to admission.

Note: The final decision to accept a person to travel on flight deck observer seats lies with the Commander.

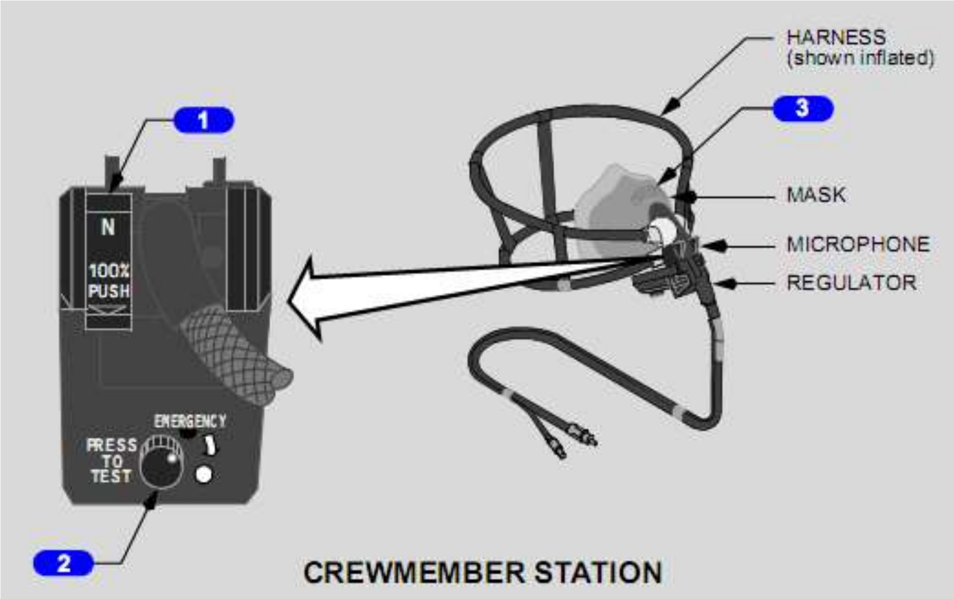
Persons carried on the flight deck shall be briefed to keep the safety belt/harness fastened as instructed and be made familiar with the relevant safety procedures including sterile cockpit philosophy.

No alcoholic beverages shall be served on the flight deck.

2.2.3.1. Jump Seat Briefing for other than Aircompany Crewmembers

The following written briefing presents procedures that should be followed by jump seat riders that are not Aircompany flight crewmembers:

1. CHECK YOUR OXYGEN MASK AND REGULATOR AS FOLLOWS:

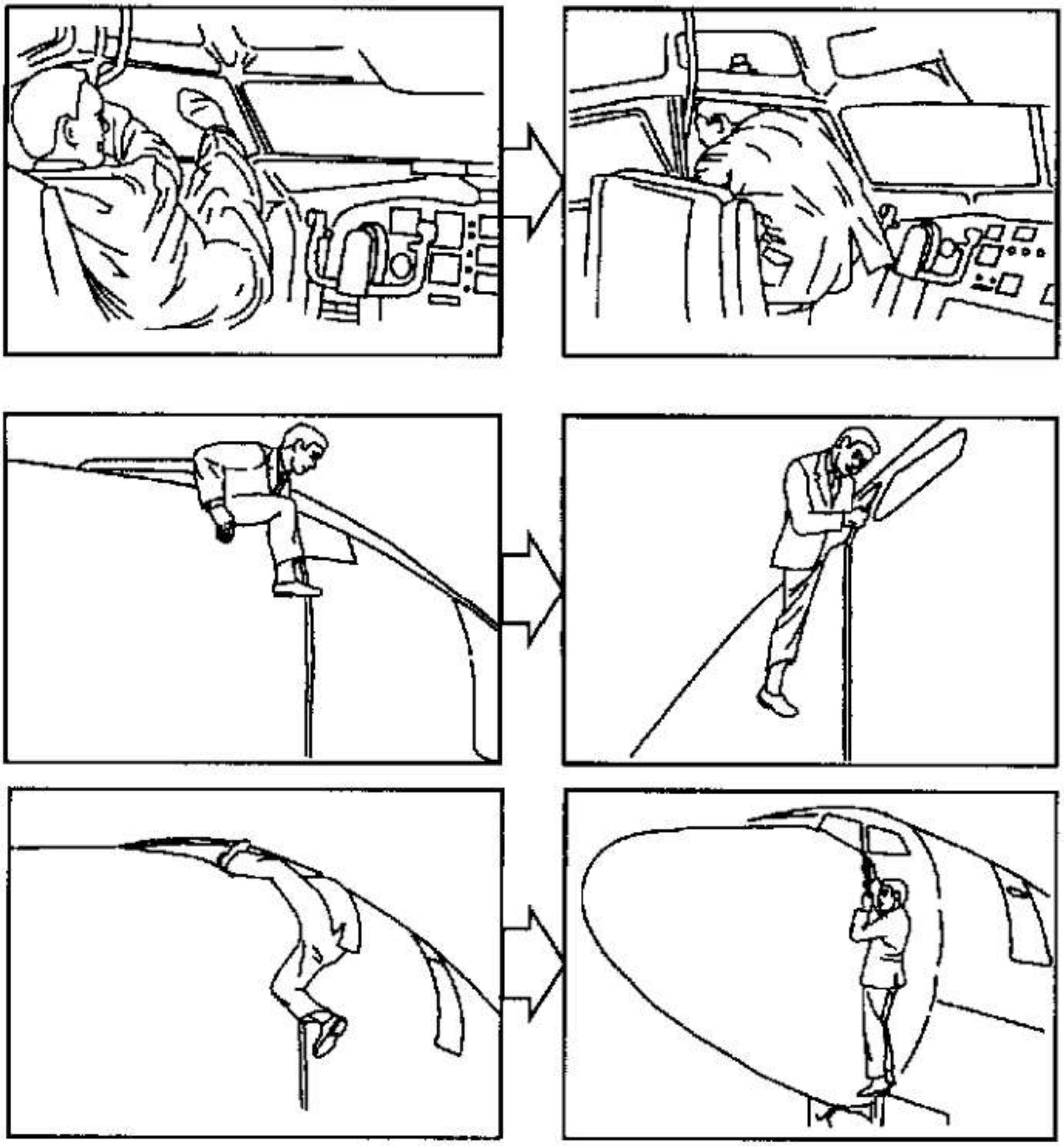


1) NORMAL/100% Switch
   a. N (normal) – supplies air/oxygen mixture on demand (ration depends on cabin altitude)
   b. 100% - supplies 100% oxygen on demand
2) Oxygen Mask EMERGENCY/Test Selector (rotary)
   a. Rotate – supplies 100% oxygen under positive pressure at all cabin altitudes
   b. PRESS TO TEST – test positive pressure supply to regulator
3) Smoke Vent Valve Selector
   a. Up – vent valve closed
   b. Down – vent valve open, allowing oxygen flow to smoke goggles

2. IN CASE OF AN EMERGENCY EVACUATION

1) Stow the jump seat as soon as possible after the aircraft has come to a complete stop.
   a. Pull up on lever on the top portion of the seat back.
   b. Collapse seat back and fold down into jump seat
   c. Squeeze both seat back and jump seat together and lift out of the way.
   d. Secure seat in bulkhead.

3. IF UNABLE TO EVACUATE OUT THE CABIN
   a. Follow either the Commander or First Officer down the escape rope.
   b. Grip the window handle, press the handle trigger and pull to open the window.
   c. Remove the cover on the emergency escape rope (located above the window).
   d. Pull the rope out of the container and lower out the window.
   e. Exit the aircraft by proceeding down the rope.
   f. After reaching the ground, clear the area.



4. GENERAL INFORMATION

- As per Aircompany`s regulation, below 10.000 feet, please restrict conversations to safety related items.

Information to crewmember: below10.000 feet, only safety related items should be discussed!

- At all times, please help the flight crew in watching for other aircraft.
- If you do not understand the preceding procedures, please ask the Commander or first officer to review any or all of these items with you.
- If the preceding briefing is understood, please inform the Commander with the statement:

  “The Jump Seat Briefing is Understood”

2.2.3.2. Permitted Persons

For the following persons the Commander may give permission to travel on the Flight Deck Observer Seat seats:

Persons personally known to a Crew Member
Aircompany Employees

2.3. PRE–DEPARTURE

Pre–departure procedure starts with crew boarding at the aircraft, but not less 30 minutes before ETD and ending before pushback or engine start procedures whichever occurs first.

2.3.1. Aircraft Security Search

Reference: refer to OM Part A chapter 10.

2.3.2. Preflight and Post Flight Scan Flow

Reference: refer to FCOM “Normal Procedures” 11.5

2.3.3. Preliminary Preflight Procedure

Normally performed by FO for the sector. PIC may do this procedure as needed.

Reference: refer to FCOM “Normal Procedures” 21.1

2.3.4. CDU Preflight Procedure

Reference: refer to FCOM “Normal Procedures” 21.4

In addition to the FCOM procedure, when the Load Sheet / Load Sheet & Trim Sheet is delivered to the Cockpit:

Both pilots will:

- have “PERF INIT” page displayed on the CDU
- have the runway analysis tables ready for use
- cross-check Load Sheet / Load Sheet & Trim Sheet and CDU for correct actual ZFW, TOW, TO CG and fuel loaded
- cross-check reduced thrust calculation and entries in the FMC
- interpolate runway analysis tables in the process of thrust reduction and V speed calculation if it is necessary
- check “TO" or "R-TO" displayed on thrust mode display
- verify that a trim value is shown (as installed)
- make sure both pilots position the white reference airspeed bugs correctly (as installed)
- select - LEG or TAKEOFF REP page, depending on whether he/she is PM or PF

The Commander will:

- Advise the F/O of ZFW, stab trim and the number of people onboard
- Advise the F/O of the flap setting to be used
- Advise the F/O of desired TRIP/CRZ altitude

The First Officer will:

- Enter ZFW and push EXEC key
- Select "TAKEOFF": Enter Derate or/ and SEL TEMP, CG and takeoff speeds to FMC.
- Use OM-B, sec. 0.2 "Units of Measurement" and the conversion table to convert all weight and mass values to the units of measure provided by the instruments and systems.

2.3.5. Exterior Inspection

Normally performed by PIC for the sector. FO may do this procedure as needed. Items at each location may be checked in any sequence. Always select position lights ON when aircraft on the ground with power ON. At Night or during low visibility select the logo, wing, wheel well lights ON for the Exterior inspection.

Use the detailed inspection route below to check that:

- the surfaces and structures are clear, not damaged, not missing parts and there are no fluid leaks
- the tires are not too worn, not damaged, and there is no tread separation
- the gear struts are not fully compressed
- the engine inlets and tailpipes are clear, the access panels are secured, the fan cowls are latched, the exterior, including the bottom of the nacelles, is not damaged, and the reversers are stowed
- the doors and access panels that are not in use are latched
- the probes, vents, and static ports are clear and not damaged
- the skin area adjacent to the pitot probes and static ports is not wrinkled
- the antennas are not damaged
- the light lenses are clean and not damaged

Reference: refer to FCOM “Normal Procedures” NP 21.6

Reference: refer to FCOM "Supplementary Procedures for cold weather operations" SP 16.1

2.3.6. Interior Inspection

- Inspection of emergency, galley, toilet equipment

Crew member must ensure permanent unhindered access to all elements of this equipment.

During pre-departure inspection of galley equipment ensure that all containers are fitted with operable doors, locks, stowed properly into allocated stowage position.

The working order of stowage locking devices shall also be checked. If any item of cabin, supernumerary area, galley, toilet equipment that is not directly connected with ensuring of flight safety is found damaged it should be recorded in cabin log.

2.3.7. Performance Calculations

The Co-pilot will normally complete the takeoff performance calculation. The Commander will then check carry out a cross check of the data against the Co-pilot´s calculation before entering the Speeds and Flex Temp which will also be cross checked by both pilots.

2.3.8. Preflight Procedure

Reference: refer to FCOM "Normal Procedures" NP 21

2.3.9. Taxi and Take-Off Briefing

We distinguish two types of briefing, Taxi & Take-Off and Approach briefings. The Taxi & Take-Off briefing shall be done preferably before engine start. The approach briefing should be completed in a timely manner before reaching top of descent (TOD).

At the end of the briefing the other crew member should be asked if he/she has any additional questions or suggestions.

PF will carry out full takeoff briefing (WRATS) as outlined below on all originating flights.

He will include in his briefing any escape route procedure applicable to the airfield of departure in case of engine failure after V1, applicable acceleration altitude for flap retraction . He will also brief the PNF on any special procedure.

Additional briefing items may be required when any elements of the takeoff and/or departure are different from those routinely used. These may include:

- Adverse weather
- Adverse runway conditions
- Unique noise abatement requirements
- Thrust (Full, R-TO, No Eng Bleed Off, R-CLB)
- Radio Aids
- Transition Altitude
- Dispatch using the minimum equipment list
- Special engine out departure procedures (if applicable)
- Any other situation where it is necessary to review or define crew responsibilities.

Each briefing should include **WRATS:**

W – Weather	Thunderstorm, Windshear - recognition and recovery procedures, Icing, Strong Wind, Adverse runway surface conditions, unusual runway slope or illusion possibilities, Poor visibility (If less than landing minima- Takeoff Alternate is required), etc.
R – Restriction	Outside restriction e.g.: speed, altitude, bank angle etc.
A – Abnormal	Aircraft malfunctions affected to particular approach, Flight dispatch restrictions MEL/CDL.
T – Terrain	MSA or any directional restriction effected by high terrain. Minimum vertical speed to assure climb gradient.
S – Specific Information	Engine Failure Pattern, RTO procedure, APU usage, birds activity, comments, personal philosophy, etc; Engine Failure Pattern will always be briefed.

The Taxi & Take-Off briefing shall be accomplished As Soon As Possible (ASAP) so as not to interfere with the final takeoff preparations.

2.4. ALTIMETER CHECKING AND SETTING

Aircompany`s aircraft shall be operated according to the barometric altimeter readings of flight level (FL) or of altitude, whichever applies. FL readings are associated with the altimeter standard pressure setting (1013.2 hPa/29.92 in Hg), while altitude readings are based on QNH.

2.4.1. Altimeters Checking

1. Before takeoff

The actual QNH shall be set in all altimeters in use. Their altitude reading shall be checked against the airport elevation and between the altimeters.

The maximum allowable on-the-ground altitude display differences is:

Field Elevation:	Max. Difference Between Commander and F/O	Max. Difference Between Commander or F/O and Field Elevation
Sea Level	40 feet	75 feet
5,000 feet	45 feet	75 feet
10,000 feet	50 feet	75 feet

2. During flying

After each resetting of the altimeters, readings shall be compared. The flying pilot's altimeter shall be governing for checking / maintaining FL and altitude.

The maximum allowable in-flight difference between PIC and Co-pilot altitude display is 200 ft for RVSM operation. (see respective aircraft OM).

2.4.2. Altimeter Setting

1. Principle

A clear distinction shall be made between the terms "flight level" and "altitude", especially when reading back clearances and reporting position.

2. Procedures

The pressure scale reading on the Commander's and Co-pilot's altimeters shall be set to a common value as follows:

- Takeoff and initial climb: the QNH prevailing at the aerodrome of departure.
- Climb, cruise: standard setting when climbing through the transition altitude.
- On passing transition level both pilots' altimeters shall be set to QNH value. When the transition level is not specified and clearance is received to descend from a flight level to an altitude below the transition level, and the QNH is given; the QNH will be set, unless further flight level vacating reports have been requested by ATC, in which case the altimeter will be set to QNH on passing the transition level.

PF	PNF
SET STD Checked	STD SET CROSS-CHECKED, PASSING FL ….. NOW
SET QNH Checked	QNH SET CROSS-CHECKED, PASSING ------ FEET NOW

- Descent, approach and landing: setting of the QNH shall be done prior to descending through transition level.

Note: during climb or descent, an anticipatory altimeter setting resulting from the procedures above may occasionally need to be reversed upon an ATC request for an unexpected level – off or for an altitude / FL report prior to crossing the transition layer.

- Aircraft altimeter system is described in respective aircraft OM.

3. Altimeter Corrections

Temperature deviation from ISA will result in erroneous readings on pressure altimeters. When the temperature is lower than standard, the true altitude will be less than indicated altitude. Depending on the amount of temperature deviation (on the colder side) and amount of height to be corrected for, significant deviations between indicated and true altitude can occur in conditions of extreme cold weather where terrain clearance is a consideration, corrections should be calculated and a higher indicated altitude established and flown.

For colder temperatures, a more accurate correction should be obtained from Tables No.1 and No.2. These tables are calculated for a sea level aerodrome. They are therefore conservative when applied at higher aerodromes.

Tab No.1 – VALUES TO BE ADDED TO MIN. PROMULGATED HEIGHTS/ALTITUDES (ft)

Aerodrome Temp. (°C)	Height above the elevation of the altimeter setting source (feet)													
	200	**300**	**400**	**500**	**600**	**700**	**800**	**900**	**1000**	**1500**	**2000**	**3000**	**4000**	**5000**
0	20	20	30	30	40	40	50	50	60	90	120	170	230	280
-10	20	30	40	50	60	70	80	90	100	150	200	290	390	490
-20	30	50	60	70	90	100	120	130	140	210	280	420	570	710
-30	40	60	80	100	120	140	150	170	190	280	380	570	760	950
-40	50	80	100	120	150	170	190	220	240	360	480	720	970	1210
-50	60	90	120	150	180	210	240	270	300	450	590	890	1190	1500

Tab No.2 – VALUES TO BE ADDED TO MIN. PROMULGATED HEIGHTS/ALTITUDES (m)

Aerodrome Temp. (°C)	**Height above the elevation of the altimeter setting source (meters)**													
	60	**90**	**120**	**150**	**180**	**210**	**240**	**270**	**300**	**450**	**600**	**900**	**1200**	**1500**
0	5	5	10	10	10	15	15	15	20	25	35	50	70	85
-10	10	10	15	15	25	20	25	30	30	45	60	90	120	150
-20	10	15	20	25	25	30	35	40	45	65	85	130	170	215
-30	15	20	25	30	35	40	45	55	60	85	115	170	230	285
-40	15	25	30	40	45	50	60	65	75	110	145	220	290	265
-50	20	30	40	45	50	65	75	80	90	135	180	270	360	450

2.4.3. Radio Altimeter Checking and Setting

- Before takeoff

  No action
- Descent

  For all CAT I and non-precision approaches MDA will be set. DHs should be checked and set as detailed below. Set radio altimeter to:
  - DH for CAT II
  - DH for CAT IIIA

2.5. TAXI, TAKE–OFF AND CLIMB (DEPARTURE)

This chapter of the OM part B provides guidance for normal operations from the start of engine through the departure and climb portion of the flight, up to but not including level-off.

2.5.1. Before Start Procedure

Reference: refer to FCOM "Normal Procedures" NP 21.25

2.5.2. Pushback or Towing Procedure

Reference: refer to FCOM "Normal Procedures" NP 21.27 Note: off-block time begins from the aircraft first moving from its parking place for the purpose of taking off

2.5.3. Engine Start Procedure

Reference: refer to FCOM "Normal Procedures" NP 21.28

2.5.3.1. Standard Phraseology with the Ground Staff

When cleared for pushback:

COMMANDER	GROUND STAFF
Announce: "READY FOR PUSHBACK"	Answer: "BYPASS PIN INSERTED, RELEASE PARKING BRAKES, COMMENCING PUSHBACK"

When airplane has stopped:

COMMANDER	GROUND STAFF
Answer: "PARKING BRAKES IS SET"	Announce: "PUSHBACK COMPLETED, SET PARKING BRAKES"

After engines start:

COMMANDER	GROUND STAFF
Announce: "BOTH ENGINES STARTED, YOU MAY DISCONNECT"	Answer: "BYPASS PIN REMOVED, DISCONNECTING, HOLD POSITION AND WAIT FOR MY SIGNAL "ALL CLEAR" AT YOUR LEFT/RIGHT"
Answer: "HOLDING POSITION, STANDING BY FOR YOUR VISUAL SIGNAL AT MY LEFT/RIGHT"	

2.5.4. Before Taxi Procedure

Reference: refer to FCOM "Normal Procedures" NP 21.29

2.5.5. Taxiing

An airport diagram should be kept in a location readily available to both crewmembers during taxi. The following guidelines aid in conducting safe and efficient taxi operations.

Prior to Taxi:

- both pilots verify the correct airplane parking
- brief applicable items from airport diagrams and related charts
- ensure both crewmembers understand the expected taxi route
- write down the taxi clearance when received.

When cleared to taxi:

PIC	FO
Receive “All Clear” signal from the marshaller, ensure both sides of aircraft are clear of obstructions	
Call “Left side clear”	Call “Right side is clear”
Caution: Do not move aircraft until both pilots check their area is clear	
Call “Lights for Taxi” Release parking brake and commence taxi	Taxi Light (as installed) Switch - ON Turn-off Lights Switch - ON

Prior to Landing:

- plan/brief the expected taxiway exit and route to parking.

After Landing:

- ensure taxi instructions are clearly understood, especially when crossing closely spaced parallel runways
- delay company communications until clear of all runways.

General Information:

1. Taxi–Out Techniques

The aircraft is normally taxiing from the left seat only, using powered nose wheel steering. Taxi procedure and speed are to be managed to operate the aircraft safely and smoothly.

All turns, accelerations and decelerations shall be carried out smoothly Make all turns with as large a radius as possible for minimum side loads and to avoid unnecessary scrubbing of tires. Use minimum thrust power above the idle to accelerate to taxi speed from a stop.

Good taxi techniques require an awareness of the proximity of obstacles, the possibility of thrust causing damage to equipment or injury to personnel

Before taxiing the aircraft, flight crew should verify proper operation of flight controls, yaw damper and position of flaps/slats for takeoff.

2. Taxi speed

When taxiing in congested areas the aircraft shall be taxied at no more than walking speed. On dry and straight high-speed taxiway and good visibility condition aircraft may be taxied at speed up to 20 knots, till 150 m from place where turn should be made or stop the aircraft.

If two or more aircraft are on the taxiway taxi speed should not be taxied at speed greater than 10 knots and distance less than 100 m from other aircraft.

3. Reverse Taxiing

Reverse taxiing should be kept to the minimum and performed only with symmetric power. Brake should not be used during reverse taxi because it may cause the aircraft to tip onto its tail, resulting in substantial damage. The aircraft shall be stopped or accelerated into forward taxi using forward thrust only. **Backing with reverse thrust is not recommended.**

Note: With antiskid inoperative, tire damage or blowouts can occur if moderate to heavy braking is used. With this condition, it is recommended that taxi speed be adjusted to allow for very light braking.

2.5.6. Situation Awareness

When “Cleared for line up” both Pilots will agree that ATC has issued a clearance to line up or to cross the runway before passing hold-short line. If any doubt exists, verify with ATC. When entering the departure runway, direct your attention outside, scan the runway and approach paths.

VERBALLY CONFIRM THAT BOTH DIRECTIONS ARE CLEAR.

The Pilot/Pilots with an unobstructed view of the approach path will call “Final is Clear”.

Final is considered “clear” even with known aircraft on extended final as long as they are not a conflict for your Take-off. Verbally acknowledge the presence of these aircraft. The intention of this is to increase awareness of landing aircraft that might pose a conflict while taking the runway.

TREAT THE RUNWAY ENVIRONMENT AS A CRITICAL ZONE.

Monitor the movement of aircraft and vehicles in the runway environment. Ensure that the departure runway, intersecting runways and taxiways, and departure flight path remain clear for your Take-off. Be vigilant for aircraft and vehicles crossing without clearance.

MENTALLY REHEARSE THE REJECTED TAKEOFF PROCEDURES.

2.5.7. Before Takeoff Procedure

Reference: refer to FCOM “Normal Procedures” NP 21.30

2.5.8. Initiating Takeoff Roll

Autothrottle and flight director use is recommended for all takeoffs. However, do not follow F/D commands until after liftoff.

A rolling takeoff procedure is recommended for setting takeoff thrust. It expedites the takeoff and reduces the risk of foreign object damage or engine surge/stall due to a tailwind or crosswind. Flight test and analysis prove that the change in takeoff roll distance due to the rolling takeoff procedure is negligible when compared to a standing takeoff.

Rolling takeoffs are accomplished in two ways:

- if cleared for takeoff before or while entering the runway, maintain normal taxi speed. When the airplane is aligned with the runway centerline ensure the nose wheel steering wheel is released and apply takeoff thrust by advancing the thrust levers to just above idle (40%N1). Allow the engines to stabilize momentarily then promptly advance the thrust levers to takeoff thrust (autothrottle TO/GA). There is no need to stop the airplane before increasing thrust.
- if holding in position on the runway, ensure the nose wheel steering wheel is released, release brakes, then apply takeoff thrust as described above.

Note: Brakes are not normally held with thrust above idle unless a static run-up in icing conditions is required.

A standing takeoff procedure may be accomplished by holding the brakes until the engines are stabilized, ensure the nose wheel steering wheel is released, then release the brakes and promptly advance the thrust levers to takeoff thrust (autothrottle TO/GA).

Allowing the engines to stabilize provides uniform engine acceleration to takeoff thrust and minimizes directional control problems. This is particularly important if crosswinds exist or the runway surface is slippery. The exact initial setting is not as important as setting symmetrical thrust. If thrust is to be set manually, smoothly advance thrust levers toward takeoff thrust.

Note: Allowing the engines to stabilize for more than approximately 2 seconds before advancing thrust levers to takeoff thrust may adversely affect takeoff distance.

After thrust is set, a small deviation in N1 between engines should not warrant a decision to reject the takeoff unless this deviation is accompanied by a more serious event.

Reference: refer to the QRH, “Manoeuvres” Chapter, “Rejected Takeoff” MAN 1.2., for criteria.

Ensure the target N1 is set by 60 knots, but minor adjustments may be made, if needed, immediately after 60 knots. Due to variation in thrust settings, runway conditions, etc., it is not practical to specify a precise tolerance in N1 difference between engines for the take-off thrust setting.

If an engine exceedance occurs after thrust is set and the decision is made to continue the take-off, do not retard the thrust lever in an attempt to control the exceedance. Retarding the thrust levers after thrust is set invalidates take-off performance. When the PF judges that altitude (minimum 400 feet AGL) and airspeed are acceptable, the thrust lever should be retarded until the exceedance is within limits and the appropriate NNC accomplished.

Use of the nose wheel steering wheel is not recommended above 30 knots. However, pilots must use caution when using the nose wheel steering wheel above 20 knots to avoid over-controlling the nose wheels resulting in possible loss of directional control. Limited circumstances such as inoperative rudder pedal steering may require the use of the nose wheel steering wheel at low speeds during take-off and landing when the rudder is not effective.

Reference: refer to MEL for more information concerning operation with rudder pedal steering inoperative.

Light forward pressure is held on the control column. Keep the airplane on centerline with rudder pedal steering and rudder. The rudder becomes effective between 40 and 60 knots. Maximum nose wheel steering effectiveness is available when above taxi speeds by using rudder pedal steering.

Regardless of which pilot is making the take-off, the Commander should keep one hand on the thrust levers until V1 in order to respond quickly to a rejected take-off condition. After V1, the Commander’s hand should be removed from the thrust levers.

The PM should monitor engine instruments and airspeed indications during the take-off roll and announce any abnormalities. The PM should announce passing 80 knots and the PF should verify that his airspeed indicator is in agreement.

A pitot system blocked by protective covers or foreign objects can result in no airspeed indication, or airspeed indications that vary between instruments. It is important that aircrews ensure airspeed indicators are functioning and reasonable at the 80-knot callout. If the accuracy of either primary airspeed indication is in question, reference the standby airspeed indicator. Another source of speed information is the ground speed indication. Early recognition of a malfunction is important in making a sound go/stop decision.

The PM should verify that take-off thrust has been set and the throttle hold mode (THR HLD) is engaged. A momentary autothrottle overshoot of 4% N1 may occur but thrust should stabilize at +/- 2% N1, after THR HLD. Thrust should be adjusted by the PM, if required, to - 0% + 1% target N1. Once THR HLD annunciates, the autothrottle cannot change thrust lever position, but thrust levers can be positioned manually. The THR HLD mode remains engaged until another thrust mode is selected.

Note: Takeoff into headwind of 20 knots or greater may result in THR HLD before the autothrottle can make final thrust adjustments.

The THR HLD mode protects against thrust lever movement if a system fault occurs. Lack of the THR HLD annunciation means the protective feature may not be active. If THR HLD annunciation does not appear, no crew action is required unless a subsequent system fault causes unwanted thrust lever movement. As with any autothrottle malfunction, the autothrottle should then be disconnected and desired thrust set manually.

If full thrust is desired when THR HLD mode is displayed, the thrust levers must be manually advanced. When making a V1(MCG)-limited takeoff, do not exceed the fixed derate thrust limit except in an emergency.

After the airplane is in the air, pushing a TO/GA switch advances the thrust to maximum available thrust and TO/GA is annunciated.

2.5.9. **Decision Speed (V1) and Rotation (VR)**

Prior to every takeoff, consideration should be given to the specific actions required to accomplish a REJECTED TAKEOFF.

Prior to 80 knots, the take-off should be rejected for any of the following:

- activation of the master caution system

- system failure(s)
- unusual noise or vibration
- tire failure
- abnormally slow acceleration
- take-off configuration warning
- fire or fire warning
- engine failure
- predictive windshear warning (if installed)
- if a side window opens
- if the airplane is unsafe or unable to fly.

Above 80 knots and prior to V1, the takeoff should be rejected for any of the following:

- fire or fire warning
- engine failure
- predictive windshear warning
- if the airplane is unsafe or unable to fly.

During the take-off, the crewmember observing the non-normal situation will immediately call it out as clearly as possible.

A stop prior to V1 may also be warranted by a Take-off Warning or malfunction where there is doubt that the airplane will fly. V1 is the maximum speed for initiating a REJECTED TAKEOFF. Therefore, the decision to STOP must be made prior to V1.

At speeds approaching V1, especially if the takeoff is runway limited, full brake pedal deflection should be applied and held until the airplane is completely stopped. If RTO (above 90 knots) auto brakes are operating, and they will disconnect when full manual braking is applied. The maximum braking effort associated with an RTO is more severe level of braking than most pilot experience in normal service.

When field length limited, a reject at V1 with two engines operating is statistically doomed to failure. If the Commander determines that there is sufficient runway remaining to stop the aircraft and a REJECT is initiated, the Commander will call "REJECT" and assume control of the aircraft even though the First Officer was making the takeoff. The FO will hold light forward elevator pressure (excessive forward pressure may decrease wheel brake effectiveness) and maintain wings level with ailerons. FO responsible to notify TOWER and for intended action.

Rejecting Takeoff after V1 is not recommended unless the Commander judges the airplane incapable of flight. Even if excess runway remains after V1, there is no assurance that the brakes will have the capacity to stop the airplane prior to the end of the runway.

Reference: for more information refer to FCTM 2.24.

2.5.10. **Rotation and Liftoff - All Engines**

Takeoff speeds are established based on minimum control speed, stall speed, and tail clearance margins. Shorter-bodied airplanes are normally governed by stall speed margin while longer-bodied airplanes are normally limited by tail clearance margin. When a smooth continuous rotation is initiated at VR, tail clearance margin is assured because computed takeoff speeds depicted in the PI chapter of the FCOM, airport analysis, or FMC, are developed to provide adequate tail clearance.

Above 80 knots, relax the forward control column pressure to the neutral position. For optimum takeoff and initial climb performance, initiate a smooth continuous rotation at VR toward 15° of pitch attitude. The use of stabilizer trim during rotation is not recommended. After liftoff, use the attitude indicator as the primary pitch reference. The flight director, in conjunction with indicated airspeed and other flight instruments is used to maintain the proper vertical flight path.

Note: Do not adjust takeoff speeds or rotation rates to compensate for increased body length.

With a consistent rotation technique, where the pilot uses approximately equal control forces and similar visual cues, the resultant rotation rate differs slightly depending upon airplane body length. Using the technique above, liftoff attitude is achieved in approximately 3 to 4 seconds. Resultant rotation rates vary from 2 to 3 degrees/second with rates being lowest on longer airplanes.

Note: The flight director pitch command is not used for rotation.

Reference: for more information refer to FCTM 2.16.

2.5.11. **Crosswind Takeoff**

The crosswind guidelines shown below were derived through flight test data, engineering analysis, and flight simulator evaluations.

Note: Engine surge can occur with a strong crosswind or tailwind component if takeoff thrust is set before brake release. Therefore, the rolling takeoff procedure is strongly advised when crosswinds exceed 20 knots or tailwinds exceed 10 knots.

Directional Control

Initial runway alignment and smooth symmetrical thrust application result in good crosswind control capability during takeoff. Light forward pressure on the control column during the initial phase of takeoff roll (below approximately 80 knots) increases nose wheel steering effectiveness. Any deviation from the centerline during thrust application should be countered inputs combined with small control wheel inputs result in a normal takeoff with no overcontrolling. Large control wheel inputs can have an adverse effect on directional control near V1(MCG) due to the additional drag of the extended spoilers.

Note: With wet or slippery runway conditions, the PM should give special attention to ensuring the engines have symmetrically balanced thrust indications.

Rotation and Takeoff

Begin the takeoff roll with the control wheel approximately centered. Throughout the takeoff roll, gradually increase control wheel displacement into the wind only enough to maintain approximately wings level.

Note: Excessive control wheel displacement during rotation and liftoff increases spoiler deployment. As spoiler deployment increases, drag increases and lift is reduced which results in reduced tail clearance, a longer takeoff roll, and slower airplane acceleration.

At liftoff, the airplane is in a sideslip with crossed controls. A slow, smooth recovery from this sideslip is accomplished by slowly neutralizing the control wheel and rudder pedals after liftoff.

Gusty Wind and Strong Crosswind Conditions

For takeoff in gusty or strong crosswind conditions, use of a higher thrust setting than the minimum required is recommended. When the prevailing wind is at or near 90° to the runway, the possibility of wind shifts resulting in gusty tailwind components during rotation or lift-off increases. During this condition, consider the use of thrust settings close to or at maximum take-off thrust. The use of a higher take-off thrust setting reduces the required runway length and minimizes the airplane exposure to gusty conditions during rotation, lift-off, and initial climb.

To increase tail clearance during strong crosswind conditions, consider using a higher VR if take-off performance permits. This can be done by:

- using improved climb take-off performance methods
- increasing VR speed to the performance limited gross weight rotation speed, not to exceed actual gross weight VR + 20 knots. Set V speeds for the actual gross weight. Rotate at the adjusted (higher) rotation speed. This increased rotation speed results in an increased stall margin, and meets take-off performance requirements.

Avoid rotation during a gust. If a gust is experienced near VR, as indicated by stagnant airspeed or rapid airspeed acceleration, momentarily delay rotation. This slight delay allows the airplane additional time to accelerate through the gust and the resulting additional airspeed improves the tail clearance margin. Do not rotate early or use a higher than normal rotation rate in an attempt to clear the ground and reduce the gust effect because this reduces tail clearance margins. Limit control wheel input to that required to keep the wings level. Use of excessive control wheel increases spoiler deployment which has the effect of reducing tail clearance. All of these factors provide maximum energy to accelerate through gusts while maintaining tail clearance margins at lift-off. The airplane is in a sideslip with crossed controls at this point. A slow, smooth recovery from this sideslip is accomplished after lift-off by slowly neutralizing the control wheel and rudder pedals.

2.5.12. **Takeoff Procedure**

Reference: refer to FCOM “Normal Procedures” NP 21.31

2.5.13. **Takeoff Flap Retraction Speed Schedule**

Reference: refer to FCOM “Normal Procedures” NP 21.34

2.5.14. **Climb and Cruise Procedure**

Reference: refer to FCOM “Normal Procedures” NP 21.34

2.6. NOISE ABATEMENT (NADP I / II)

The Noise Abatement Procedures means the reduction of the noise, at takeoff and climb phase of flight, through operating procedures. Two Noise Abatement procedures are given in ICAO Document 8168 PANS – OPS (Procedures for Air Navigation Services – Aircraft Operations).

Anything from adduced in this paragraph CAN NOT force a Commander to undertake actions influencing on a flight safety.

Aircraft operating procedures for the takeoff climb shall ensure that the necessary safety of flight operations is maintained whilst minimizing exposure to noise on the ground.

The first procedure (NADP 1) is intended to provide noise reduction for noise sensitive areas in close proximity to the departure end of the runway.

The second procedure (NADP 2) provides noise reduction to areas more distant from the runway end.

The two procedures differ in that the acceleration segment for flap/slat retraction is either initiated prior to reaching the maximum prescribed height or at the maximum prescribed height. To ensure optimum acceleration performance, thrust reduction may be initiated at an intermediate flap setting.

Note 1: For both procedures, intermediate flap transitions required for specific performance related issues may be initiated prior to the prescribed minimum height; however, no power reduction can be initiated prior to attaining the prescribed minimum altitude.

Note 2: The indicated airspeed for the initial climb portion of the departure prior to the acceleration segment is to be flown at a climb speed of V2 plus 20 to 40 km/h (10 to 20 kt).

- NOISE ABATEMENT CLIMB — PROCEDURE ALLEVIATING NOISE CLOSE TO THE AERODROME (NADP 1) (Aircompany standard Takeoff profile)

  This procedure involves a power reduction at or above the prescribed minimum altitude and the delay of flap/slat retraction until the prescribed maximum altitude is attained. At the prescribed maximum altitude, accelerate and retract flaps/slats on schedule while maintaining a positive rate of climb, and complete the transition to normal en-route climb speed.

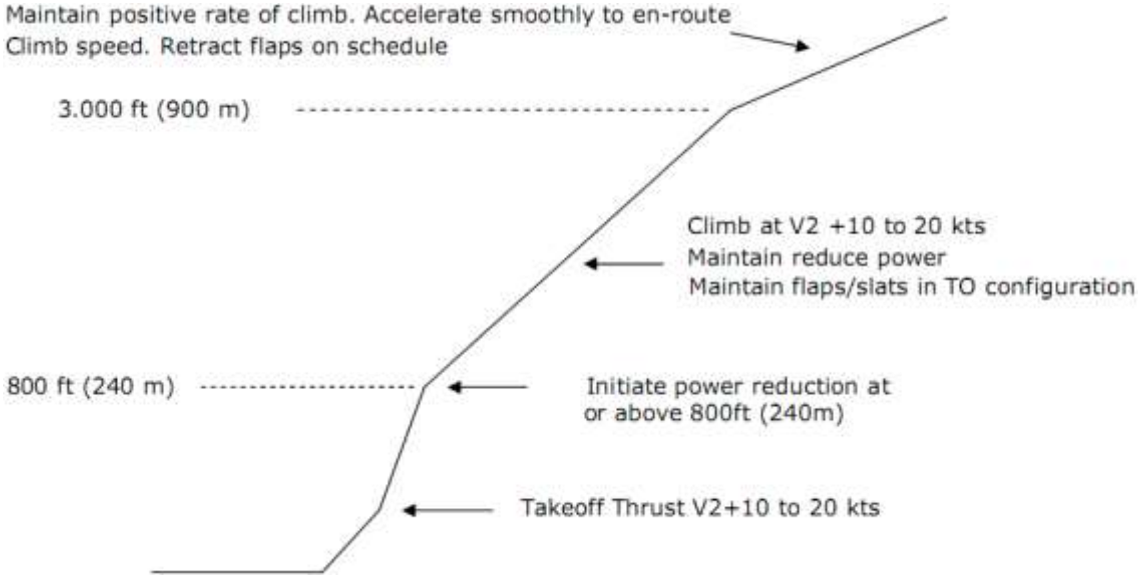
  The noise abatement procedure is not to be initiated at less than 240m (800 ft) above aerodrome elevation.

  The initial climbing speed to the noise abatement initiation point shall not be less than V2 plus 20 km/h (10 kt).

  On reaching an altitude at or above 240 m (800 ft) above aerodrome elevation, adjust and maintain engine power/thrust in accordance with the noise abatement power/thrust schedule provided in the air craft operating manual. Maintain a climb speed of V2 plus 20 to 40 km/h (10 to 20 kt) with flaps and slats in the take-off configuration.

  At no more than an altitude equivalent to 900 m (3,000 ft) above aerodrome elevation, while maintaining a positive rate of climb, accelerate and retract flaps/slats on schedule.

  At 900 m (3,000 ft) above aerodrome elevation, accelerate to en-route climb speed.



- NOISE ABATEMENT CLIMB —PROCEDURE ALLEVIATING NOISE DISTANT FROM THE AERODROME (NADP 2)

  This procedure involves initiation of flap/slat retraction on reaching the minimum prescribed altitude. The flaps/slats are to be retracted on schedule while maintaining a positive rate of climb. The power reduction is to be performed with the initiation of the first flap/slat retraction or when the zero flap/slat con figuration is attained. At the prescribed altitude, complete the transition to normal en-route climb procedures.

  The noise abatement procedure is not to be initiated at less than 240 m (800 ft) above aerodrome elevation.

  The initial climbing speed to the noise abatement initiation point is V2 plus 20 to 40 km/h (10 to 20kt).

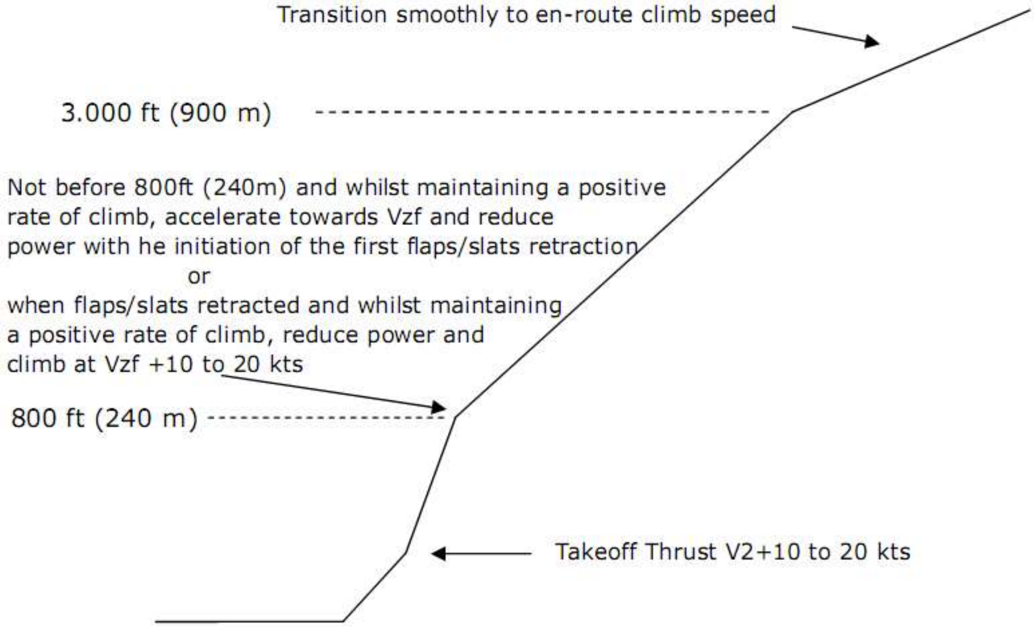
  On reaching an altitude equivalent to at least 240 m (800 ft) above aerodrome elevation, decrease aircraft body angle/angle of pitch whilst maintaining a positive rate of climb, accelerate towards VZF and either:

- reduce power with the initiation of the first flap/ slat retraction; or

- reduce power after flap/slat retraction.

  Maintain a positive rate of climb, and accelerate to and maintain a climb speed of VZF + 20 to 40 km/h (10 to 20 kt) to 900 m (3,000 ft) above aerodrome elevation.

  On reaching 900 m (3,000 ft) above aerodrome elevation, transition to normal en-route climb speed.



SUPERCEDED NOISE ABATEMENT PROCEDURES

Note: Many locations continue to prescribe the former Noise Abatement Departure Procedures A and B. Though no longer part of the ICAO PANS-OPS Doc. 8168, they have been reproduced in the following paragraphs as supplementary information.

NOISE ABATEMENT DEPARTURE PROCEDURE A (NADP A)

- Take-off to 1.500 ft (450m) above aerodrome elevation:
  - take-off power o take-off flap
  - climb at V2 + 20 to 40 km/h (V2 + 10 to 20 kt) (or as limited by body angle).
- At 1.500 ft (450m):
  - reduce thrust to not less than climb power/ thrust.
- At 1.500 ft (450m) to 3.000ft (900 m):
  - climb at V2 + 20 to 40 km/h (V2 + 10 to 20 kt).
- At 3.000ft (900 m):
  - accelerate smoothly to en-route climb speed with flap retraction on schedule.

NOISE ABATEMENT DEPARTURE PROCEDURE B (NADP B)

- Take-off to 1.000 ft (300 m) above aerodrome elevation:
  - take-off power/thrust o take-off flap
  - climb at V2 + 20 to 40 km/h (V2 + 10 to 20 kt).
- At 1.000 ft (300 m)
  - maintaining a positive rate of climb, accelerate to zero flap minimum safe maneuvering speed (VZF) retracting flap on schedule;
    - Thereafter, reduce thrust consistent with the following:
    - for high by-pass ratio engines reduce to normal climb power/thrust;
    - for low by-pass ratio engines, reduce power / thrust to below normal climb thrust but not less than that necessary to maintain the final take-off engine-out climb gradient; and
    - for Aircrafts with slow flap retracting reduce power / thrust at an intermediate flap setting; thereafter, from 300m (1,000ft) to 900m (3,000ft):
      - continue climb at not greater than VZF + 20 km/h (VZF+10kt).
- At 3.000 ft (900 m):
  - accelerate smoothly to en-route climb speed.

2.7. CRUISE AND DESCENT

Reference: refer to FCOM "Normal Procedures" NP 21.34: 21.36

2.7.1. **Cruise**

2.7.1.1. **General**

Aircompany`s policy is to fly ECON speed at the assigned Cost Index. When requested to fly different speeds by ATC this should only be done where necessary and for as short a time as possible. Do not routinely change descent speeds even though the CI can induce quite low speeds, again, only do so at request of ATC.

2.7.1.2. **RVSM Check**

Altimeters (CAPT, Standby and F/O) check has to be performed on ground and in flight and must be logged in the navigation flight plan before entering RVSM airspace and there after every one hour.

2.7.1.3. **Engine Monitoring**

Engine reading log shall be performed during cruise for all flights more than 1 ½ hour. The Autothrottle must be off, and the engine stabilized at cruise thrust for at least 5 minutes.

2.7.1.4. **Time and Fuel Check**

Time and fuel check shall be logged on the navigation flight plan at least every 1 hour for flights longer than 1 hour.

2.7.1.5. **Monitoring FMC Operation**

The FMC is an accurate and sophisticated navigation system. It can, however, give erroneous information and must therefore be continuously and closely monitored.

Maintain situational awareness of your position and flight plan progress.

When ATC assigns you a long-range "direct" clearance, creating abeam fix waypoints approximately every 150-200 miles or 30 minutes is desirable. As a general rule, you should always be able to provide a position report off or a nearby fix.

Monitor flight plan reference fixes on the CDU FIX page.

Do a raw data accuracy check from time to time.

Observe that the Active Route Line (Magenta) on the EHSI and that the Waypoint Sequence on LEGS Pages agree with the Actual Flight Plan.

Note: Do not leave the "AUTO-MANUAL" switch (if installed) in "MANUAL" after completion of a raw data cross-check. Switch back to "AUTO" as soon as possible.

2.7.1.6. **Cruise Performance Economy**

The flight plan fuel burn from departure to destination is based on certain assumed conditions. These include takeoff gross weight, cruise altitude, route of flight, temperature, enroute winds, and cruise speed. Actual fuel burn should be compared to the flight plan fuel burn throughout the flight.

The planned fuel burn can increase due to:

- temperature above planned
- a lower cruise altitude than planned
- cruise altitude more than 2,000 feet above optimum altitude
- speed faster than planned or appreciably slower than long range cruise speed when long range cruise was planned
- stronger headwind component
- fuel imbalance
- excessive thrust lever adjustments.

Cruise fuel penalties include:

- ISA + 10°C: 1% increase in trip fuel
- 2,000 feet above/below optimum altitude: 1% to 2% increase in trip fuel
- 4,000 feet below optimum altitude: 3% to 5% increase in trip fuel
- 8,000 feet below optimum altitude: 8% to 14% increase in trip fuel
- Cruise speed 0.01M above LRC: 1% to 2% increase in trip fuel.

For cruise within 2,000 feet of optimum, long range cruise speed can be approximated by using 0.74M. Long range cruise also provides the best buffet margin at all cruise altitudes. Always use all opportunities to fly as possible to FMC optimum flight level.

Note: If a discrepancy is discovered between actual fuel burn and flight plan fuel burn that cannot be explained by one of the items above, a fuel leak should be considered. Accomplish the applicable non-normal checklist.

Basically, flight should be made with appropriate Cost Index (CI). Increase in speed above CI speed should be considered only when requested by ATC.

A flight estimated to arrive at the gate more than 10 minutes early should slow enough to arrive no more than 10 minutes early, but not slower than long-range cruise (for fuel savings and so that you will have gate space available upon your arrival). However, always cheerfully comply with ATC speed requests.

During all phase of flight –climb, cruise and descent use all possibilities for short cuts and direct routing wherever feasible.

2.7.1.7. **Trim Technique**

Reference: for recommended procedures please refer to FCTM 1.22..

2.7.1.8. **Fuel Balancing**

Lateral imbalance between main tank 1 and 2 must be scheduled to be ZERO. Random fuel imbalance must not exceed 453 kg (1000 lbs) for taxi, takeoff, flight or landing.

During critical phase of flight fuel balancing should be delayed (IN TURB, CLB, DES) until condition or workload permit.

Normally, fuel balancing procedure should be accomplished when the fuel balance limit is reached. Both pilots should be in a cockpit If an engine fuel leak is suspected Accomplish the ENGINE FUEL LEAK checklist.

Maintain main tank No.1 and No.2 fuel balance within limitations.

WARNING: Fuel pump pressure should be supplied to the engines at all times. At high altitude, without fuel pump pressure, thrust deterioration or engine flameout may occur.

IF CENTER TANK CONTAINS FUEL:

Center tank fuel pump switches OFF

Crossfeed selector .... OPEN

Verify CROSSFEED VALVE OPEN light illuminate bright than dim

Fuel pump switches (low tank) .... OFF

When quantities are balanced:

Fuel pump switches (main tank) .... ON

Center tank fuel pump switches .... ON

Crossfeed selector .... CLOSE

Verify CROSSFEED VALVE OPEN light illuminate bright than extinguish

IF CENTER TANK CONTAINS NO FUEL:

Crossfeed selector .... OPEN

Verify CROSSFEED VALVE OPEN light illuminate bright than dim

Fuel pump switches (low tank) .... OFF

When quantities are balanced:

Fuel pump switches .... ON

Crossfeed selector .... CLOSE

Verify CROSSFEED VALVE OPEN light illuminate bright than extinguish

2.7.1.9. **Cockpit Door Operation**

When a routine request is made by Aircompany Crew member through interphone Flight crew use the FLT DK DOOR switch moving momentary to UNLK – access is granted.

The video surveillance display may be used at the discretion of the crew to identify individuals requesting flight deck entry.

Admission to Flight Deck

No person, other than flight crew members assigned to a flight, shall be admitted to, or carried on, the flight deck unless the Commander himself or his designated deputy is present on the flight deck, and unless this person is

- a member of the operating crew, or
- a representative of the Authority responsible for certification, licensing or inspection, if this is required for the

performance of his official duties, or

- an employee of other national aeronautical authorities or of the company or its maintenance contractor if this is required for the performance of his official duties, or
- an employee of the Company.

Under no circumstances may alcohol be taken into the flight deck.

A person shall only be carried on the flight deck provided that a seat with safety belt/safety harness is available and that the requirements concerning supplemental oxygen are met. The person shall be instructed to keep the safety belt/safety harness fastened at all times (see section 2.2.4) not to touch any controls, switches, instruments, circuit breakers, and shall be briefed in the use of all flight deck relevant emergency equipment and all relevant procedures.

Validation of Permitted Persons

The commander may not permit flight deck access if not in compliance with section “Admission to Flight Deck” above. Permitted persons must have a valid photographic ID. A valid ID is a Aircompany card or airport pass that satisfies the Commander as to the bona fide of the person. All such IDs must be shown to and checked by the Commander before the flight. If further validation is required to establish the bona fide, the Commander should telephone the staff personnel manager.

Access the Flight Deck

The crew must revert to the fallowing procedure:

- Cabin contact flight crew via interphone to advise that they wish to enter the flight deck.
- Ensure no any persons are in the forward lavatory or galley area, close curtain(s).
- Aircompany crew enter code on keypad or provide a special signal.
- Flight crew identify person requesting access through spy hole before unlocking door/denying access.

Flight Crew Napping Procedures

N/A

2.7.1.10. **Passenger Briefing**

N/A.

2.7.1.11. **Cruise Flight Monitoring**

Every one hours, complete an aircraft Cruise Status Flow.

Assess the following:

- Electrical power
- Hydraulic system
- Cabin pressurization
- Cabin temperature
- Engine status
- Fuel usage
- Flight plan progress

Select the BAT position on the DC Meter Selector. A pulsing or high steady charge indicates a possible defective battery that should be checked by Maintenance.

2.7.1.12. **Turbulence**

Reference: refer to FCOM SP.16 “Severe Turbulence Supplementary Procedure”

2.7.1.13. **Approach Briefing**

Complete the approach briefing as soon as practical, preferably before arriving at top of descent. This allows full attention to be given to airplane control. Before the briefing pilots will switch responsibility for the aircraft. Before the start of an instrument approach, the PF should brief the PM of his intentions in conducting the approach. Both pilots should review the approach procedure. All pertinent approach information, including minimums and missed approach procedures, should be reviewed and alternate courses of action considered. As a guide, the approach briefing should include at least the following:

- weather and NOTAMS at destination and alternate, as applicable
- transition level
- type of approach and the validity of the charts to be used
- navigation and communication frequencies to be used
- minimum safe sector altitudes for that airport
- approach procedure including courses and heading
- vertical profile including all minimum altitudes, crossing altitudes and approach minimums
- speed restrictions
- determination of the Missed Approach Point (MAP) and the missed approach procedure

- other related crew actions such as tuning of radios, setting of course information, or other special requirements
- taxi routing to parking
- any appropriate information related to a non-normal procedure
- management of AFDS.

Each briefing should include **WRATS:**

W – Weather	Thunderstorm, Windshear - recognition and recovery procedures, Icing, Strong Wind, Adverse runway surface conditions, unusual runway slope or illusion possibilities, etc.
R – Restriction	Outside restriction e.g.: speed, altitude, bank angle etc.
A – Abnormals	Aircraft malfunctions affected to particular approach.
T – Terrain	MSA or any directional restriction effected by high terrain.
S – Specific Information	If an instrument approach is anticipated, the PF will brief and set necessary items at same time for both pilots as to his intentions on the conduct of the approach, with both pilots reviewing the approach procedure.

2.7.2. **Descent**

2.7.2.1. **General Information**

All Instrument Approaches have common basics:

- Good Descent Planning
- Careful Review of Approach Procedures
- Accurate Flying
- GOOD CREW COORDINATION
- Advice each other what your intentions are

Both pilots will have the Instrument Approach and Landing Charts available on the Control Wheel Clip Board Correction should be made for Low Temperatures and strong Winds. Airborne APU starts (if required) should be accomplished prior to final approach.

Note: for CAT II/IIIA Approaches APU shall be started below FL100.

2.7.2.2. **Terrain Clearance**

Safe terrain clearance must be maintained during the entire approach by accurate navigation and appropriate crosschecks. Radar vectoring by ATC should provide adequate terrain clearance. Nevertheless, radar vectoring instructions do not relieve the pilot of his responsibility to ensure that he maintains a safe altitude at all times. The crew should utilize all available aids to monitor the airplane's position and height. Do not blindly follow ATC vectors. If there is doubt about your position the crew may refuse an ATC clearance, do not descent below MSA, request an alternative clearance. Use of Terrain mode is very helpful to maintain terrain clearance awareness. If radar contact is lost, climb to MSA unless you are already established on final or can maintain VMC. Terrain clearance is of vital importance when a technical problem arises on the aircraft. It is easy to become distracted and forget about the world outside the cockpit. Remember:

- Fly The Aircraft
- Check Terrain Clearance
- Check Safety Height
- Check Altimeter Setting
- Assign Task And Deal With The Problem

Below 3000' AFE a maximum of 3000'/min V/S

Below 2000' AFE a maximum of 2000'/min V/S should be avoided.

2.7.2.3. **Descent Planning**

Start the Descent Planning and Descent Procedure before the airplane descends below the cruise altitude for arrival at destination. The goal of descent planning is to arrive at the desired Waypoint at the proper Altitude, Speed and Configuration and achieve a minimum fuel burn whilst satisfying weather, ATC and aircraft requirements. Early descents waste fuel. Late descents waste fuel (not as much as early descents), are uncomfortable , Descend/Forecast page for better FMC path calculation:

- Set 250 kts target speed below FL 100 (10, 000') as company standard or other appropriate SPEED/ALT restrictions according to STAR.

  Note: If ATC requests high speed below FL100 the crew should (in any case) reduce speed so that it will be 250 knots or less at 5000 feet AGL.
- The descent forecast page is used for pre - descent planning to enter forecast data for more precise descent path calculation.
- The primary entries are wind direction and speed for up to three descent altitudes, and the altitude that anti–icing is

turned on and off.

- Additionally destination altimeter setting, ISA deviation and transition level shall be entered. Such entries help to optimize FMC computations for the descent profile.
- The transition level shall always be verified or revised.

Plan an idle descent, based on distance to the most restrictive of all altitude and speed requirements. Start descent as close as possible to FMC computed TOD. During descent use CI speeds unless otherwise by ATC. At .72/280/250 the distance required is approximately 2.9-3.0 times the altitude loss, adjusted +/- 2 miles per 10 knots of tail/head wind. If schedule block time can still be achieved, a descent at ECON "0"/minimum drag or 250 knots will conserve more fuel and require more descent distance. During descent, continuous updating of the profile is necessary to account for unknown wind, etc. Hold a speed either side of the planned speed which allows you to stay on profile. A faster speed will waste energy and a slower speed conserves energy. If you are 30 miles from the runway, at 10,000 ft. AGL and 250 knots, on a straight-in approach, you are "ON PROFILE."

Do not forget to accomplish following:

A – ATIS (Obtain)

B – Briefing (completed)

C – Checklist

In order to effect a smooth and safe approach and landing, all approaches must be planned and performed with the highest precision. A precise approach technique is required not only to ensure safety during the approach itself, but also to bring the aircraft to a safe stop after touchdown.

This is especially important on short runways and/or when adverse weather and/or runway conditions exist. If the approach is not stabilised when passing 1000ft AAL IMC or 500 ft AAL VMC, or if it becomes unstable in an instrument approach close to minima, a go-around shall be made.

Crews will make the following calls:

PF	PNF
	On passing 1000 ft AAL IMC **"1000 FT STABILISED" or "1000 FT NOT STABILISED-GO AROUND"**
"CHECKED" is stabilised or **"GO AROUND-FLAPS"** if not stabilised	
	On Passing 500 ft AAL VMC if no 1000ft call was made **"500FT STABILISED"** or **"1000FT NOT STABILISED GO AROUND"**
"CHECKED" is stabilised or **"GO AROUND-FLAPS"** if not stabilised	

2.7.2.4. **Descent Procedure**

Reference: refer to FCOM NP.21.36

2.8. APPROACH, LANDING PREPARATION AND BRIEFING

2.8.1. Altimeters Bug Setting

2.8.1.1. Radio Altimeter

A Radio Altimeter (RA) is normally used to determine DH when a DA(H) is specified for Category II or Category III approaches, or to determine alert height (AH) for Category III approaches. Procedures at airports with irregular terrain may use a marker beacon instead of a DH to determine the missed approach point. The radio altimeter may also be used to cross check the primary altimeter over known terrain in the terminal area.

However, unless specifically authorized, the radio altimeter is not used for determining MDA(H) on instrument approaches. It should also not be used for approaches where use of the radio altimeter is not authorized (RA NOT AUTHORIZED). However, if the radio altimeter is used as a safety backup, it should be discussed in the approach briefing.

2.8.1.2. CAT II/III Approach

On the EFIS Control Panels rotate the “Decision Height Selector” to set appropriate “DH” or “RA”, if published, in the Decision Height Reference Indicator. Check “DH” or “RA” value displayed on EADI.

Note: Display on EADI blanks when a negative decision height is selected.

On the Barometric Altimeters, rotate Reference Altitude Marker Control to set CAT I “DA”.

2.8.1.3. CAT I Approach

On the Barometric Altimeters, rotate Reference Altitude Marker Control to set DA.

On the EFIS Control Panels rotate the “Decision Height Selector” to set appropriate “DH” (as reference only if needed). Check “DH” value displayed on EADI.

2.8.1.4. Non-Precision Approaches

On the Barometric Altimeters, rotate Reference Altitude Marker Control to set CDA=MDA+50 ft for continuous descent approach.

On the EFIS Control Panels rotate the “Decision Height Selector” to set appropriate “MDH” or 500 feet, whichever is lower in the Decision Height Reference Indicator (as reference only if needed). Check “MDH” or 500 feet value displayed on EADI.

2.8.1.5. Circle-to Land

On the Barometric Altimeters, rotate Reference Altitude Marker Control to set MDA for Circle-to Land.

On the EFIS Control Panels rotate the “Decision Height Selector” to set 500 feet in the Decision Height Reference Indicator (as reference only if needed). Check 500 feet value displayed on EADI.

2.8.1.6. Visual Approach

On the Barometric Altimeters, rotate Reference Altitude Marker Control to set MDA for Circle-to Land or 500 feet + Airport Field Elevation (AFE), whichever is higher.

On the EFIS Control Panels rotate the “Decision Height Selector” to set 500 feet in the Decision Height Reference Indicator. Check 500 feet value displayed on EADI.

2.8.2. Autobrakes

The use of autobrake is optional. However, it is strongly recommended to be used in preference to manual braking whenever landing on a limited runway, a slippery runway, landing in strong crosswind conditions and during CAT II / III landings. Also, if local airport regulations specify use of idle reverse. When using autobrake, select setting according to weight, runway length and runway condition:

- “1”- Light manual braking beginning at 80 knots provides the least wear and tear; however, “1” setting provides a nominal deceleration rate suitable for routine operations when runway considerations permit.
- “2” or “3”- Use when moderate deceleration rates are required for wet/icy and slippery runways or when landing rollout distance is limited.
- “MAX” – This section should be used when maximum deceleration rate is required for minimum stop distance.

Expect autobrake application after touchdown with thrust levers near idle and main wheel spin-up.

If the autobrake INOP light illuminates, return Autobrake selector to OFF.

2.8.3. Approach Procedure

Reference: refer to FCOM NP.21.38

2.8.3.1. Flap Extension Schedule

Reference: refer to FCOM NP.21.39

Using flaps as speedbrakes is not recommended. The following procedures are used for flap extension:

- Select flaps 1 when decelerating through the flaps-up maneuvering speed.
- When appropriate, select the next flap position and then set the airspeed cursor to that flap maneuver speed (usually flaps 5 approximately three (3) miles to FAF).

2.9. VFR APPROACH

A VFR approach is an approach under VFR flight rules.

Cancelling IFR to a VFR aerodrome is acceptable; however, VFR at night is prohibited in any circumstances.

Reference: details are contained in Operations Manual Part A, Section 8.3.1.6

2.9.1. **Procedure**

For VFR approach procedure use the same procedure as for the Visual Approach.

Reference: refer to FCOM NP.21.38.

2.10.INSTRUMENT APPROACH

2.10.1. ILS Approaches

2.10.1.1.General

*2.10.1.1.1. **Instrument Approaches***

All safe instrument approaches have certain basic factors in common. These include good descent planning, careful review of the approach procedure, accurate flying, and good crew coordination. Thorough planning is the key to a safe, unhurried, professional approach.

Ensure the waypoint sequence on the LEGS page, altitude and speed restrictions, and the map display reflect the air traffic clearance. Last minute air traffic changes or constraints may be managed by appropriate use of the MCP heading, altitude and airspeed selectors. Updating the waypoint sequence on the LEGS page should be accomplished only as time permits.

Complete the approach preparations before arrival in the terminal area. Set decision altitude or height DA(H). Crosscheck radio and pressure altimeters whenever practical. Do not completely abandon enroute navigation procedures even though air traffic is providing radar vectors to the initial or final approach fix. Check ADF/VOR selector set to the proper position. Verify ILS, VOR and ADF are tuned and identified if required for the approach.

During ILS approaches applicable raw data **MUST** be monitored throughout the approach.

During ILS approaches monitoring raw data is **MANDATORY**.

One pilot is required to monitor raw data using the VOR/LOC mode no later than the final approach fix inbound.

Check that the marker beacon is selected on the audio panel. The course and glide slope signals are reliable only when their warning flags are not displayed, localizer and glide slope pointers are in view, and the ILS identifier is received. Confirm the published approach inbound course is set or displayed.

Do not use radio navigation aid facilities that are out of service even though flight deck indications appear normal. Radio navigation aids that are out of service may have erroneous transmissions that are not detected by airplane receivers and no flight deck warning is provided to the crew.

*2.10.1.1.2. **Approach Category***

An aircraft approach category is used for straight-in approaches. The designated approach category for an aircraft is defined using the maximum certified landing weight as listed in the AFM. Under FAA criteria, the speed used to determine the approach category is the landing reference speed (VREF). ICAO and other regulatory agencies may use different criteria.

Category	IAS
C	121 knots or more but less than 141 knots
D	141 knots or more but less than 166 knots

*2.10.1.1.3. **Approach Clearance***

When cleared for an approach and on a published segment of that approach, the pilot is authorized to descend to the minimum altitude for that segment. When cleared for an approach and not on a published segment of the approach, maintain assigned altitude until crossing the initial approach fix or established on a published segment of that approach. If established in a holding pattern at the final approach fix, the pilot is authorized to descend to the procedure turn altitude when cleared for the approach.

Note: Non-ILS approaches using VNAV require FMC U7.1 or later.

When conducting an instrument approach from the holding pattern, continue on the same pattern as holding, extend flaps to 5 on the outbound track parallel to final approach course. Turn inbound on the procedure turn heading. This type of approach is also referred to as a race track approach.

*2.10.1.1.4. **Procedure Turn***

On most approaches the procedure turn must be completed within specified limits, such as within 10 NM of the procedure turn fix or beacon. The FMC depicted procedure turn, or holding pattern in lieu of procedure turn, complies with airspace limits. The published procedure turn altitudes are normally minimum altitudes.

The FMC constructs the procedure turn path based upon predicted winds, 170 knot airspeed and the “excursion” distance in the nav database for the procedure.

Adjust time outbound for airspeed, wind effects, and location of the procedure turn fix. If the procedure turn fix is crossed at an excessively high ground speed, the procedure turn protected airspace may be exceeded. The procedure turn should be monitored using the map to assure the airplane remains within protected airspace.

*2.10.1.1.5. **Landing Minima***

Most regulatory agencies require visibility for landing minima. Ceilings are not required. There are limits on how far an airplane can descend without visual contact with the runway environment when making an approach. Descent limits are based on a decision altitude or height DA(H) for approaches using a glide slope or a MDA(H) for approaches that do not use vertical guidance, or where a DA(H) is not authorized for use. Most agencies do not require specific visual references below alert height (AH).

Approach charts use the abbreviation DA(H) or MDA(H). DA(H) applies to Category I, II, and certain fail passive Category III operations. A decision altitude "DA" or minimum descent altitude "MDA" is referenced to MSL and the parenthetical height "(H)" is referenced to Touchdown Zone Elevation (TDZE) or threshold elevation.

When RVR is reported for the landing runway, it typically is used in lieu of the reported meteorological visibility.

2.10.1.1.6. ***Radio Altimeter***

A Radio Altimeter (RA) is normally used to determine DH when a DA(H) is specified for Category II or Category III approaches, or to determine alert height (AH) for Category III approaches. Procedures at airports with irregular terrain may use a marker beacon instead of a DH to determine the missed approach point. The radio altimeter may also be used to cross check the primary altimeter over known terrain in the terminal area. However, unless specifically authorized, the radio altimeter is not used for determining MDA(H) on instrument approaches. It should also not be used for approaches where use of the radio altimeter is not authorized (RA NOT AUTHORIZED). However, if the radio altimeter is used as a safety backup, it should be discussed in the approach briefing.

2.10.1.2.**Landing Procedure - ILS Approaches**

Reference: refer to FCOM NP.21.39

2.10.2. **Landing Procedure - Non ILS Approaches**

2.10.2.1.**General**

Definitions

- RNAV approach - an instrument approach procedure that relies on airplane area navigation equipment for navigational guidance. The FMS on Boeing airplanes is FAA-certified RNAV equipment that provides lateral and vertical guidance referenced from an FMS position. The FMS uses multiple sensors (as installed) for position updating to include GPS, DME-DME, VOR-DME, LOC-GPS, and IRS.
- GPS approach - an approach designed for use by airplanes using stand-alone GPS receivers as the primary means of navigation guidance. However, Boeing airplanes using FMS as the primary means of navigational guidance, have been approved by the FAA to fly GPS approaches provided an RNP of 0.3 or smaller is used.

  Note: A manual FMC entry of 0.3 RNP is required if not automatically provided.
- VOR approach
- NDB approach
- LOC, LOC-BC, LDA, SDF, IGS, TACAN, or similar approaches.

Non-ILS approaches are flown using V/S pitch modes. Recommended roll modes are VOR/LOC or HED SEL, provided in the FCOM procedure.

2.10.2.1.1. ***Continuous Descent Final Approach***

Over the past several decades there have been a number of CFIT and unsterilized approach incidents and accidents associated with non-ILS approaches and landings. Many of these could have been prevented by the use of Continuous Descent Final Approach (CDFA) methods. Traditional methods of flying non-ILS approaches involve setting a vertical speed on final approach, leveling off at step-down altitudes (if applicable) and at MDA(H), followed by a transition to a visual final approach segment and landing. These traditional methods involve changing the flight path at low altitudes and are not similar to methods for flying ILS approaches. Further, these traditional methods often require of the crew a higher level of skill, judgment and training than the typical ILS approach.

The following sections describe methods for flying non-ILS CDFA. These methods provide a constant angle approach, which reduces exposure to crew error and CFIT accidents. These methods also make it much easier for the crew to achieve a stabilized approach to a landing once suitable visual reference to the runway environment has been established.

A typical Instrument Approach using V/S, as illustrated, assumes all preparations for the approach; such as review of the approach procedure and setting of minima and radio tuning have been completed. The procedures illustrated focus generally on crew actions and avionics systems information. The flight pattern may be modified to suit local traffic and air traffic requirements.

The following discussions assume a straight-in instrument approach is being flown. A circling approach may be flown following an instrument approach using V/S provided the MCP altitude is set in accordance with the circling approach procedure.

2.10.2.1.2. ***Company Descent Altitude (Height) - CDA(H)***

The pilot flying should expand the instrument scan to include outside visual cues when approaching CDA(H). Do not continue the approach below CDA(H) unless the airplane is in a position from which a normal approach to the runway of intended landing can be made and suitable visual reference can be maintained. Upon arrival at CDA(H) or any time thereafter, if any of the above requirements are not met, immediately execute the missed approach procedure. When suitable visual reference is established, maintain the descent path to the flare. Do not descend below the visual glide path.

2.10.2.1.3. ***Types of Approaches***

Non-ILS approaches should be flown using V/S mode.

*2.10.2.1.4. **Use of the Autopilot during Approaches***

Automatic flight is the preferred method of flying non-ILS approaches. Automatic flight minimizes flight crew workload and facilitates monitoring the procedure and flight path. During non-ILS approaches, autopilot use allows better course and vertical path tracking accuracy, reduces the probability of inadvertent deviations below path, and is therefore recommended until suitable visual reference is established on final approach.

The autopilot must be disengaged before the airplane descends more than 50 feet below the minimum descent altitude (MDA) unless it is coupled to an ILS glide slope and localizer or in the go-around mode.

Manually flying non-ILS approaches in IMC conditions increases workload and does not take advantage of the significant increases in efficiency and protection provided by the automatic systems. However, to maintain flight crew proficiency, pilots may elect to use the flight director without the autopilot when in VMC conditions.

*2.10.2.1.5. **Raw Data Monitoring Requirements***

During localizer-based approaches; LOC, LOC-BC, LDA, SDF, and IGS, applicable raw data **MUST** be monitored throughout the approach.

During non-localizer-based approaches monitoring raw data is **MANDATORY**. One pilot is required to monitor raw data using the VOR/LOC mode no later than the final approach fix inbound.

Checking raw data for correct navigation before commencing the approach may be accomplished by:

- displaying the VOR and/or ADF pointers on the map display and using them to verify your position relative to the map display.

*2.10.2.1.6. **MAP Displays and Raw Data***

The map mode should be used to the maximum extent practicable. The map display provides a plan view of the approach, including final approach and missed approach routing. The map increases crew awareness of progress and position during the approach.

The map is particularly useful when the inbound course does not align with runway centerline and allows the pilot to clearly determine the type of alignment maneuver required. The map can be used to integrate weather radar returns, terrain or traffic information within the approach path and airport area.

One EHSI must be in the VOR/LOC mode no later than the final approach fix.

Note: When appropriate, compare airplane position on the map with ILS, VOR, DME, and ADF systems to detect possible map shift errors. Use of the VOR/ADF function selectable on the EFIS control panel is the recommended method for making this comparison.

*2.10.2.1.7. **Use of LNAV***

Use of LNAV for final approaches is not authorized.

*2.10.2.1.8. **Use of VNAV***

Use of VNAV for final approaches is not authorized.

*2.10.2.1.9. **Non - ILS Approach - One Engine Inoperative***

Maneuvering before and after the final approach fix with one engine inoperative is the same as for an all engine non-ILS approach.

2.10.2.2.**Procedure Turn and Initial Approach**

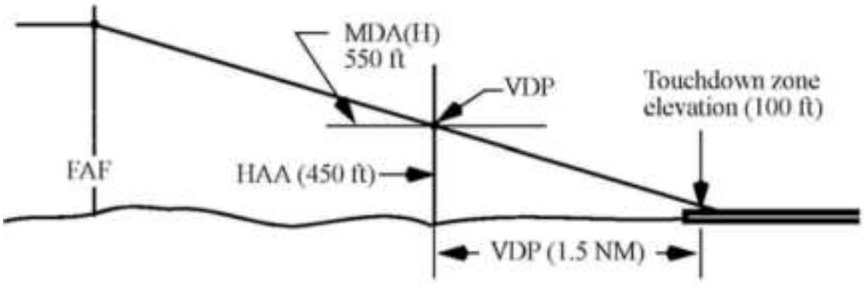
Cross the procedure turn fix at flaps 5 and flaps 5 maneuvering airspeed. If a complete arrival procedure has been selected via the CDU, the initial approach phase may be completed using appropriate modes.

2.10.2.3.**Visual Descent Point**

For a non-ILS approach, the VDP is defined as the position on final approach from which a normal descent from the MDA(H) to the runway touchdown point may be initiated when suitable visual reference is established. If the airplane arrives at the VDP, a stabilized visual segment is much easier to achieve since little or no flight path adjustment is required to continue to a normal touchdown.

VDPs are indicated on some non-ILS approach charts by a "V" symbol. The distance to the runway is shown below the "V" symbol. If no VDP is given, the crew can determine the point where to begin the visual descent by determining the height above the airport (HAA) of the MDA(H) and use 300 feet per NM distance to the runway.

In the following example, an MDA(H) of 550 feet MSL with a 100 feet touchdown zone elevation results in a HAA of 450 feet. At 300 feet per NM, the point to begin the visual descent is 1 V NM distance from the runway.



Most VDPs are between 1 and 2 NM from the runway. The following table provides more examples.

HAA (feet)	300	400	450	500	600	700
VDP Distance, NM	1.0	1.3	1.5	1.7	2.0	2.3

Note: VNAV is not authorized.

When flying an instrument approach using V/S, if the pilot adjusts the altitude range arc to approximately the VDP distance in front of the runway by varying the vertical speed, the airplane will remain close to or on the proper path for typical non-ILS approaches.

2.10.2.4.**Missed Approach - Non-ILS**

Reference: FCOM NP.21.43/FCTM 4.41..

2.10.3. **Landing Procedure - Instrument Approach using V/S**

2.10.3.1.**Approach Preparations for using V/S**

Select the approach procedure from the arrivals page of the FMC. Tune and identify appropriate NAVAIDs. If additional waypoint references are desired, use the FIX page. To enable proper LNAV waypoint sequencing, select a straight-in intercept course to the FAF when being radar vectored to final approach. Verify/enter the appropriate RNP and set the MDA(H) using the BARO minimums selector. If required to use MDA(H) for the approach minimum altitude, the barometric minimums selector should be set at Company Descend Altitude (CDA). CDA=MDA + 50 feet to ensure that if a missed approach is initiated, descent below the MDA(H) does not occur during the missed approach.

2.10.3.2.**Final Approach using V/S**

Approaching intercept heading, select flaps 5.

Approaching the FAF (approximately 2 NM), select gear down and flaps 15 and adjust speed. Set the MCP altitude window to the first intermediate altitude constraint, or CDA(H) if no altitude constraint exists.

Note: If desired altitude is not at an even 100 foot increment, set the MCP altitude to the nearest 100 ft. increment above the altitude constraint or CDA(H).

When initiating descent to CDA(H), select landing flaps, slow to final approach speed and do the Landing checklist. If the charted FAF is too close to the runway to permit a stabilized approach, consider establishing final approach pitch mode and configuring for approach and landing earlier than specified in the FCOM procedure.

At or after the FAF, select V/S mode and descend at appropriate vertical speed to arrive at the CDA(H) at a distance from the runway (VDP) to allow a normal landing profile. Initial selection of an appropriate V/S should be made considering the recommended vertical speeds that are published on the approach chart, if available. These recommended vertical speeds vary with the airplane's ground speed on final approach. If no recommended vertical speeds are available, set approximately -700 to -800 fpm.

You may use simple rule to calculate V/S against ground speed. V/S=GS/2+50 fpm (ex: If G/S is 140 kts, set Vertical Speed 750 fpm.)

When stabilized in a descent on final approach, use one of the following techniques to make small incremental changes to the resulting vertical speed to achieve a constant angle descent to minimums. There should be no level flight segment at minimums.

Several techniques may be used to achieve a constant angle path that arrives at CDA(H) at or near the VDP:

- the most accurate technique is to monitor the VNAV path deviation indication on the map display and adjust descent rate to maintain the airplane on the appropriate path. This technique requires the path to be defined appropriately on the legs page and that the header GPx.xx is displayed for the missed approach point or there is a RWxx, MXxx, or named waypoint on the legs page with an altitude constraint which corresponds to approximately 50 ft. threshold crossing height. When this method is used, crews must ensure compliance with each minimum altitude constraint on the final approach segment (step-down fixes)
- using 300 feet per NM for a 3° path, determine the desired HAA which corresponds to the distance in NM from the runway end. The PM can then call out recommended altitudes as the distance to the runway changes (Example: 900 feet - 3 NM, 600 feet - 2 NM, etc.). The descent rate should be adjusted in small increments for significant deviations from the nominal path.

DME FIX	TCH	1.0	2.0	3.0	4.0	5.0	6.0	7.0
ALT (AAH)	50	370	690	1010	1330	1650	1970	2290

- using approach chart to check distance from DME vs passing altitude, if published.

Be prepared to land or go-around from the CDA(H) at the VDP. Note that a normal landing cannot be completed from the published missed approach point on many instrument approaches.

Approximately 300 feet above the CDA(H), select the missed approach altitude. Leaving the CDA(H), disengage the autopilot and disconnect the autothrottle. Turn both F/Ds OFF, then place both F/Ds ON. This eliminates unwanted commands for both pilots and allows F/D guidance in the event of a go-around. Complete the landing.

On the V/S approach, the missed approach altitude is set when 300 feet above the CDA(H) to use the guidance of the altitude range arc during the approach and to prevent altitude capture and destabilizing the approach.

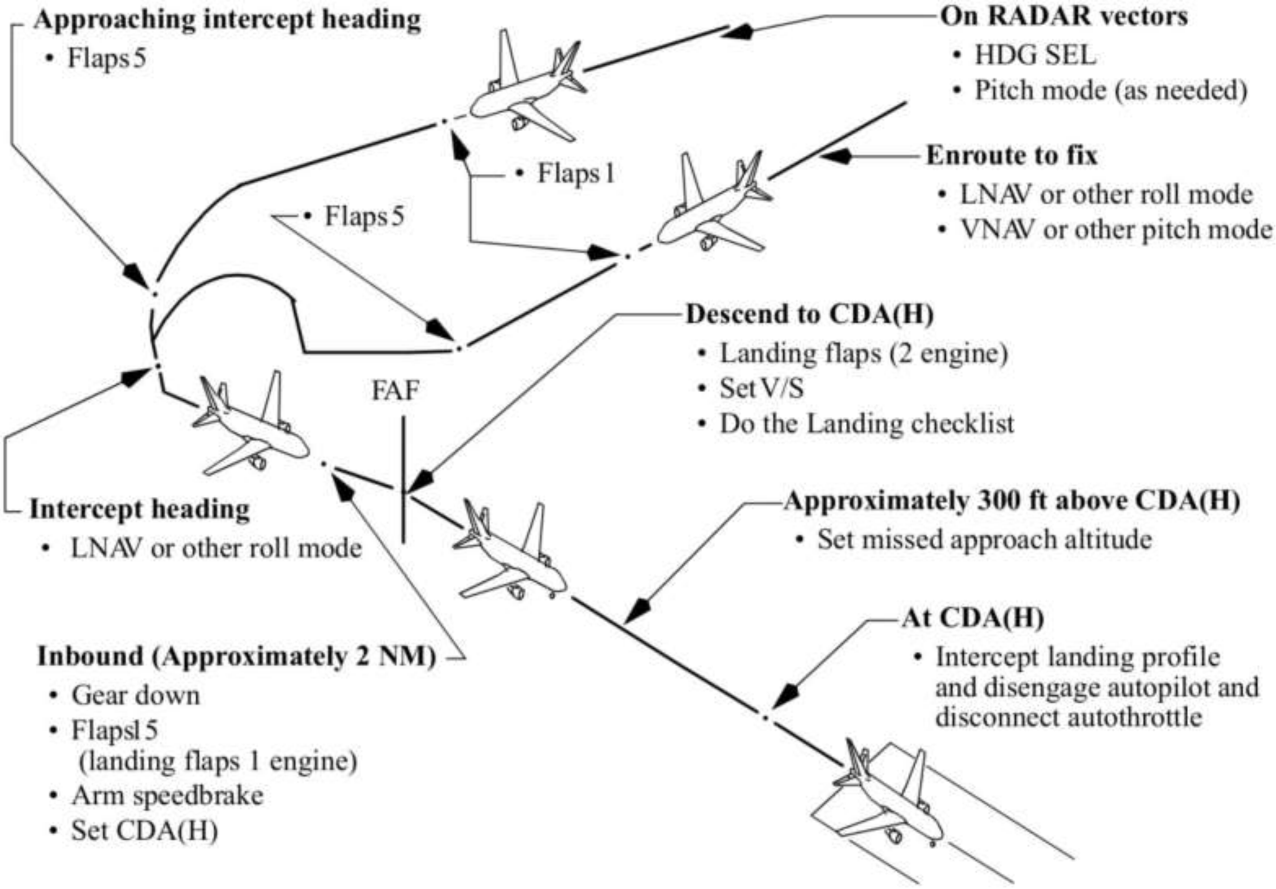
Unlike an approach using VNAV, the occurrence of VNAV ALT is not an issue. Since there is no below path alerting, keeping the CDA(H) set as long as possible is recommended to help prevent inadvertent descent below MDA(H).

2.10.3.3.**Landing Procedure – Instrument Approach Using V/S**

Pilot Flying	Pilot Monitoring
	Notify the flight crew to prepare for landing. Verify that the cabin is secure.
Call "FLAPS_" according to the flap extension schedule.	PM Verify air speed suitable for desired flap selection and call: “CHECK SPEED, FLAPS__” Set the flap lever as directed. Monitor flaps and slats extension. When flaps/slats extended and agrees to desired position with no amber lights call: “FLAPS __ SET, GREEN LIGHT”
The roll modes for the final approach are: • for a LOC-BC, or NDB approach, use HED SEL • for a LOC, SDF, VOR or LDA approach, use VOR/LOC or HED SEL.	
When on the final approach course intercept heading for LOC, LOC-BC, SDF, or LDA approaches: • verify that the localizer is tuned and identified • verify that the LOC pointer is shown. • PM should check chosen RW and approach on CDU “DEP/APP” or RTE page and state “RW __ , Approach (type) __ Checked”.	
Use HED SEL or arm the VOR/LOC mode.	
Use HDG SEL to intercept the final approach course as needed.	
Verify that the VOR/LOC is captured.	
Approximately 2 NM before the final approach fix and after ALT HOLD is annunciate: • verify that the autopilot is engaged • CDA(H) on the MCP • select or verify speed intervention (as installed)	Call "APPROACHING GLIDE PATH."
Approaching glide path, call: • "GEAR DOWN" • "FLAPS 15"	Set the landing gear lever to DN. Verify that the green landing gear indicator lights are illuminated. Call: “SPEED CHECKED, FLAPS 15” Set the flap lever to 15. Monitor flaps and slats extension. When flaps/slats extended and agrees to desired position with no amber lights call: “FLAPS 15 SET, GREEN LIGHT” Set the engine start switches to CONT.
Set the speed brake lever to ARM. Verify that the SPEEDBRAKE ARMED light is illuminated.	
Beginning the final approach descent, call "FLAPS_" as needed for landing.	Call: “SPEED CHECKED, FLAPS _” Set the flap lever as directed. Monitor flaps and slats extension. When flaps/slats extended and agrees to desired position with no amber lights call: “FLAPS __ SET, GREEN LIGHT”
Call "LANDING CHECKLIST."	Do the LANDING checklist.

Pilot Flying	Pilot Monitoring
At the final approach fix, verify the crossing altitude and crosscheck the altimeters.	
Monitor the approach.	
When at 300 feet above the CDA, set the missed approach altitude on the MCP.	
At the final approach fix, verify the crossing altitude and crosscheck the altimeters.	
Monitor the approach.	
Continue the final approach descent using the vertical deviation scale and pointer as reference.	
If suitable visual reference is established at CDA(H), or the missed approach point, disengage the autopilot and autothrottle. Maintain the glide path to landing.	

Landing Procedure - Instrument Approach using V/S



2.10.4. Landing Procedure - Instrument Approach using VNAV

Not authorized.

2.10.5. Landing Procedure - Circling Approach

The circling approach should be flown with landing gear down, flaps 15, and at flaps 15 maneuvering speed. Use the weather minima associated with the anticipated circling speed. Maintain MCP altitude or MDA(H) using ALT HOLD mode and use HDG SEL for the maneuvering portion of the circling approach. If circling from an ILS approach, fly the ILS in VOR/LOC and V/S modes.

Note: If the MDA(H) does not end in “00”, set the MCP altitude to the nearest 100 feet above the MDA(H) and circle at MCP altitude.

Use of the APP mode for descent to a circling approach is not recommended for several reasons:

- the AFDS does not level off at MCP altitude
- exiting the APP mode requires initiating a go-around or disengaging the autopilot and turning off the flight directors.

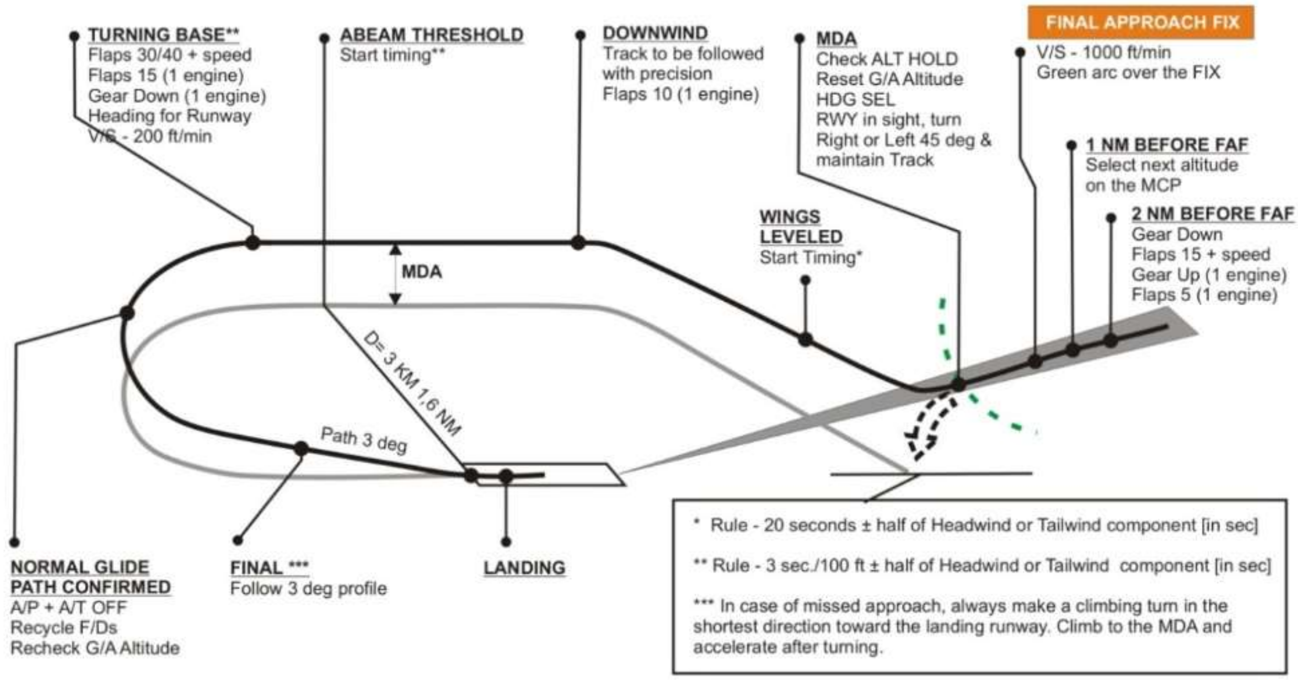
When in altitude hold at MCP altitude or MDA(H) and before commencing the circling maneuver, set the missed approach altitude.

Before turning base or when initiating the turn to base leg, select landing flaps and begin decelerating to the approach speed plus wind correction. To avoid overshooting final approach course, adjust the turn to final to initially aim at the inside edge of the runway threshold. Timely speed reduction also reduces turning radius to the runway. Do the Landing checklist. Do not descend below MDA(H) until intercepting the visual profile to the landing runway.

Leaving MDA(H), disengage the autopilot and autothrottle. After intercepting the visual profile, cycle both F/D to OFF, then to ON. This eliminates unwanted commands for both pilots and allows F/D guidance in the event of a go-around. Complete the landing.

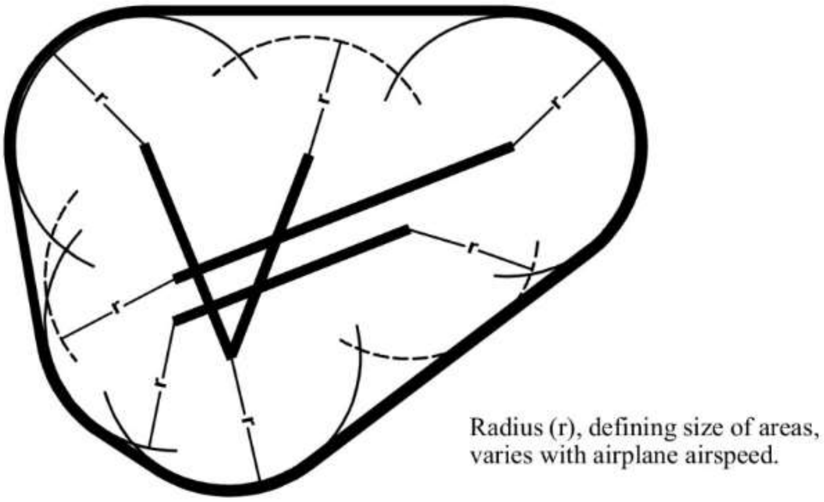
Note: If a go-around is selected with either flight director switch in the OFF position, the flight director pitch or roll command bar on the corresponding side will disappear when the first pitch or roll mode is selected or engaged.

Circling Approach



2.10.5.1.**Obstruction Clearance**

Obstruction clearance areas during the circling approach are depicted in the following figure. Distances are determined by the maximum IAS during the circling approach and are depicted in the table following the figure.



ICAO	
Maximum IAS	Circling Area Radius (r) from Threshold
180 Kts	4,2 NM
205 Kts	5.28 NM

Note: Adjust airplane heading and timing so that the airplane ground track does not exceed the obstruction clearance distance from the runway at any time during the circling approach.

2.10.5.2.**Circling Approach - One Engine Inoperative**

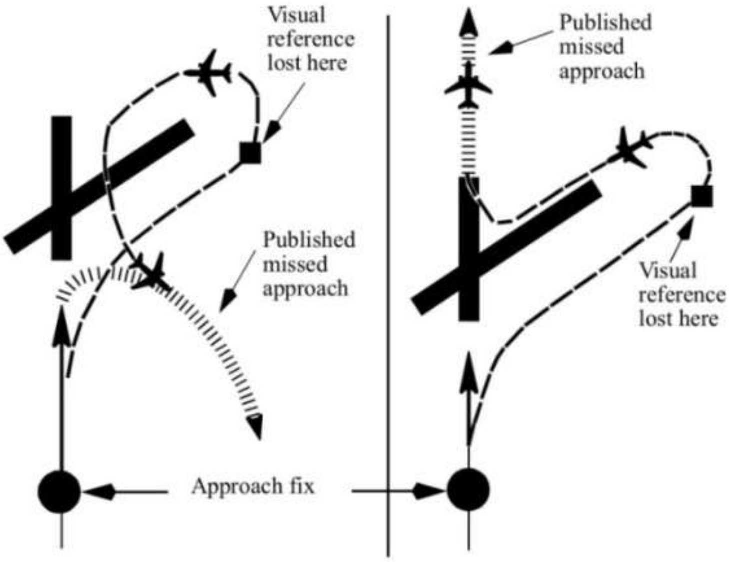
If a circling approach is anticipated, maintain gear up, flaps 10, and flaps 10 maneuvering speed from the final approach fix until just before turning base. As an option, use flaps 5, and flaps 5 maneuvering speed as the approach flaps setting for the circling approach. Before turning base or when initiating the turn to base leg, select gear down and flaps 15 and begin reducing speed to VREF 15 + wind correction. Do not descend below MDA(H) until intercepting the visual profile.

Note: For single engine circling approaches use category D minima.

2.10.5.3.**Missed Approach - Circling**

If a missed approach is required at any time while circling, make a climbing turn in the shortest direction toward the landing runway. This may result in a turn greater than 180° to intercept the missed approach course. Continue the turn until established on an intercept heading to the missed approach course corresponding to the instrument approach procedure just flown. Maintain the missed approach flap setting until close-in maneuvering is completed.

Different patterns may be required to become established on the prescribed missed approach course. This depends on airplane position at the time the missed approach is started. The following figure illustrates the maneuvering that may be required. This ensures the airplane remains within the circling and missed approach obstruction clearance areas.



In the event that a missed approach must be accomplished from below the MDA(H), consideration should be given to selecting a flight path which assures safe obstacle clearance until reaching an appropriate altitude on the specified missed approach path.

Reference: Refer to Go-Around and Missed Approach Procedure, this chapter.

2.11.VISUAL APPROACH AND CIRCLING

2.11.1. Visual Approach

The recommended landing approach path is approximately 2 1/2° to 3°. Once the final approach is established, the airplane configuration remains fixed and only small adjustments to the glide path, approach speed, and trim are necessary. This results in the same approach profile under all conditions.

2.11.1.1.Thrust usage

Engine thrust and elevators are the primary means to control attitude and rate of descent. Adjust thrust slowly using small increments. Sudden large thrust changes make airplane control more difficult and are indicative of an unstable approach.

No large changes should be necessary except when performing a go-around. Large thrust changes are not required when extending landing gear or flaps on downwind and base leg. A thrust increase may be required when stabilizing on speed on final approach.

2.11.1.2.Downwind and Base Leg

Fly at an altitude of 1500 feet above the field elevation (AFE) and enter downwind with flaps 5 at flaps 5 maneuvering speed. Maintain a track parallel to the landing runway approximately 2 NM abeam.

Before turning base or initiating the turn to base, extend the landing gear, select flaps 15, arm the speedbrake, and slow to flaps 15 maneuvering speed or approach speed plus wind correction if landing at flaps 15. If the approach pattern must be extended, delay lowering gear and selecting flaps 15 until approaching the normal visual approach profile.

Rules of thumb (V=150 kts, wind calm):

- 300 feet of height stands for 1 NM distance
- 1 min of flight stands for 2,5 NM of ground distance
- 180° turn takes 54 sec (bank 25°) or 44 sec (bank 30°).

Turning base leg, adjust thrust as required while descending at approximately 600-700 fpm. If you use AP for approach set RW heading, missed approach altitude and use V/S as a pitch mode for descend.

Extend landing flaps before turning final. Allow the speed to decrease to the proper final approach speed and trim the airplane. Do the Landing checklist. When established in the landing configuration, maneuvering to final approach may be accomplished at final approach speed (VREF + wind correction).

If you use AP - Disconnect the autopilot and autothrottle, recycle FD “OFFON” in order to arm and set all for missed approach. Autopilot and autothrottle should be disconnected not lower than MDA(H) – 50 ft.

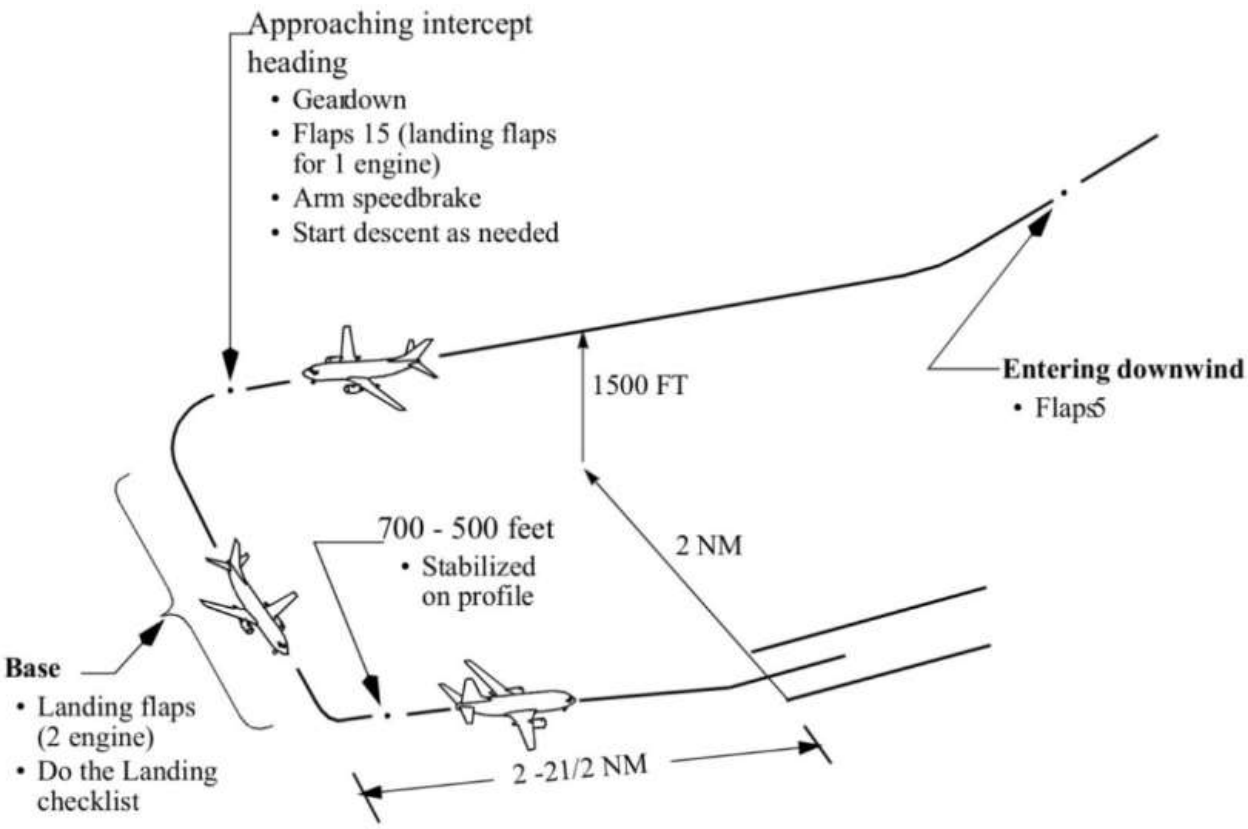
2.11.1.3.Final Approach

Roll out of the turn to final on the extended runway centerline and maintain the appropriate approach speed. An altitude of approximately 300 feet AFE for each NM from the runway provides a normal approach profile. Attempt to keep thrust changes small to avoid large trim changes. With the airplane in trim and at target airspeed, pitch attitude should be approximately the normal approach body attitude. At speeds above approach speed, pitch attitude is less. At speeds below approach speed, pitch attitude is higher. Slower speed reduces aft body clearance at touchdown. Stabilize the airplane on the selected approach airspeed with an approximate rate of descent between 700 and 900 feet per minute on the desired glide path, in trim. Stabilize on the profile by 500 feet above touchdown.

Note: Descent rates greater than 1,000 fpm should be avoided.

With one engine inoperative, the rudder trim may be centered before landing. This allows most of the rudder pedal pressure to be removed when the thrust of the operating engine is retarded to idle at touchdown.

Full rudder authority and rudder pedal steering capability are not affected by rudder trim. If touchdown occurs with the rudder still trimmed for the approach, be prepared for the higher rudder pedal forces required to track the centerline on rollout.



2.11.1.4.**Engine Failure On Final Approach**

In case of engine failure on visual final approach, use the procedure described in the "Go-Around and Missed Approach" subchapter.

2.11.1.5.**Flight Crew Recommendation**

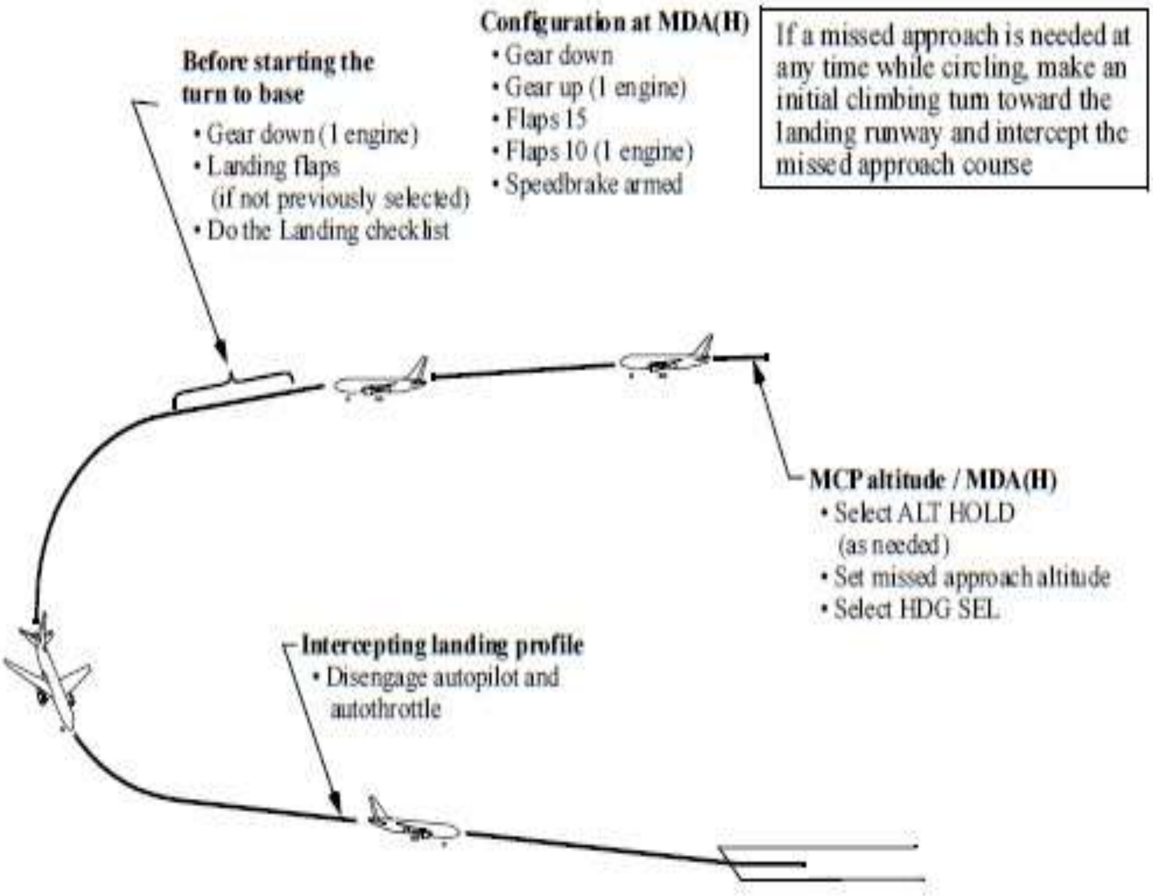
- Always include and discuss a possibility of visual approach in your landing briefing if weather condition permits to execute it.
- Minimum safe altitudes such as GRID MORA, MSA, MDA STAR minimum altitudes must be always discussed
- Plan constant descent profile for approach
- Use speed 250 below FL100 as a general rule.
- Construct Way Point on final distance 4 nm from thresholds and set altitude restriction 1300 feet above airport elevation in it.
- "Landing Gear down, Flap 15" configuration must by achieved not lower than 1500 feet above airport elevation.
- Full landing configuration (Gear down, Flap 30/40) must by achieved not lower than 1000 feet above airport field elevation (AFE).
- Altimeters bug setting: Barometric Altimeter - MDA for circle to land or 500 feet plus airport field elevation (AFE) whichever is higher.
- Minimum MCP Altitude settings – 1000 feet above airport field elevation (AFE). Further descent from this altitude is prohibited if no visual contact with runway or aircraft not on descent profile.

Visual approaches in CIS airport must be planned according to rule below:

- Overfly over Outer marker is mandatory
- Airplane must be in full landing configuration (Gear down, Flap 30/40) over outer marker
- Altitude of the aircraft over outer marker must be according to appropriate runway ILS/VOR/NDB approach chart, but in each case not lower then MDH for circle to land.
- Remember that Outer marker in CIS airports is located at distance 2,2-2,3 nm from the threshold
- Recommended pitch mode for visual approach – V/S (vertical speed), for more precise descent profile control.

2.11.2. **Circling**

DEFINITION: The visual phase of an instrument approach to bring an Aircraft into position for landing on a runway which is not suitably located for a straight-in approach.


Before starting the turn to base
• Gear down (1 engine)
• Landing flaps (if not previously selected)
• Do the Landing checklist
Configuration at MDA(H)
• Gear down
• Gear up (1 engine)
• Flaps 15
• Flaps 10 (1 engine)
• Speedbrake armed
If a missed approach is needed at any time while circling, make an initial climbing turn toward the landing runway and intercept the missed approach course
MCP altitude / MDA(H)
• Select ALT HOLD (as needed)
• Set missed approach altitude
• Select HDG SEL
Intercepting landing profile
• Disengage autopilot and autothrottle

2.12.GO-AROUND AND MISSED APPROACH

2.12.1. General

Be go-around minded. There are times when even the best pilot finds himself in a situation where he is too high, too fast, not in proper configuration to make a safe landing or safe landing is not guaranteed:

Then there is only one answer GO-AROUND

Dual Channel Caution: Steady RED A/P warning light indicates that elevator position is not suitable for single channel operation. Disengage A/P and execute manual level off or select a higher altitude on the MCP.

Note: After a missed approach from an ILS/LOC/VOR approach, remember to reselect "AUTO" on the "VHF NAV" Panels (if installed) as soon as practicable to enable the FMC to again autotune DMEs for update.

The Autopilot may be re-engaged at PF's discretion after the airplane is in Trim. Normal Auto Flight System Modes are available.

Reference: for Go-Around and Missed Approach Procedure refer to FCOM NP.21.43..

2.12.2. Initiation of a Prescribed Missed Approach

- If the required visual reference has not been established upon reaching DH/DA for precision approaches
- If the required visual reference has not been established upon reaching MDA(H)/CDA(H) for Non-precision approaches
- If the reported RVR when overhead the outer marker or equivalent is below the applicable minimum
- If the surface wind reported prior landing, including maximum winds (gusts) exceeds the applicable limit
- If the approach is not stabilized
- If the approach success becomes doubtful, i.e. localizer (half scale deflection) or glidepath (half scale deflection - Airplane below glideslope) tolerances are exceeded, or +/- 5 degrees deviation from published final approach track on NDB and VOR approaches.
- Upon instruction of the appropriate ATC unit
- If any time after descent below DH/DA or MDA(H)/CDA(H), the required visual reference to the ground or lights cannot be maintained
- If any element of the ground navigation system or airborne equipment required for approach under actual conditions becomes inoperative/is suspected to be malfunctioning
- If a reset of the approach minimum below 1.000 ft AAL would be required and visual reference has not been established
- Whenever the Commander deems necessary
- Confusion exists or crew coordination is lost
- If it appears to any one of the pilots that the approach success is doubtful or flight safety is jeopardized
- If the appropriate malfunction checklists are not completed at 1000ft above airport elevation or crew task is overloaded

Note: It is authorized to execute not more than two consecutive approaches resulted in go-around, except for emergency situations or significant improvement in meteorological conditions on landing aerodrome.

Note: Go-around is considered as an action in interest of FLIGHT SAFETY and is not subject of investigations.

2.12.3. Stabilized Approach Criteria (SAp)

It is essential that every approach is stabilized early enough for the pilot to be able to detect windshear or other unacceptable deviations from the correct flight path.

When aircraft is landing in an abnormal configuration it may be necessary to prepare and configure the aircraft so that it stabilized early than the above limits.

All flights must be stabilized by 1,000 feet above airport field elevation (AFE) in instrument meteorological conditions (IMC) and by 500 feet above airport field elevation (AFE) in visual meteorological conditions (VMC). An approach is stabilized when all of the following criteria are met:

- The aircraft is on the correct flight path
- Only small changes in heading/pitch are required to maintain the correct flight path;
- The aircraft speed is not more than VREF + 20 knots IAS and not less than VREF;
- The aircraft is in the correct landing configuration;
- Sink rate is no greater than 1,000 feet per minute; if an approach requires a sink rate greater than 1,000 feet per minute, a special briefing should be conducted;
- Engine power setting is appropriate for the aircraft configuration;
- All briefings and checklists have been conducted;
- Specific types of approaches are stabilized if they also fulfill the following: instrument landing system (ILS) approaches must be flown within one dot of the glideslope and localizer;
- VOR(NDB) approaches must be flown within +/- 5 deg of final approach course
- Category II or Category III ILS approach must be flown within the expanded localizer band;

- Unique approach procedures or abnormal conditions requiring a deviation from the above elements of a stabilized approach require a special briefing.
- During a circling approach, wings should be level on final when the airplane reaches 300 feet AFE

WARNING: If stabilized approach is not obtained, a go-around/missed approach is mandatory.

WARNING: It is the duty and responsibility of the PM to direct a goaround when the stabilized approach condition are not met or any time the approach or landing appears unsafe. Unsterilized approaches are not acceptable.

CAUTION: No report to Flight Operations is required due to a goaround caused by failure to achieve a stabilized approach criteria.

CAUTION: For CAT II/IIIA Approaches the aircraft MUST BE stabilized not later than OM or 1000 ft.

2.12.4. **Normal Landing**

A landing should not be attempted unless the runway threshold is crossed with the aircraft established at the correct height and airspeed to touchdown on the centerline within the prescribed touchdown area.

The approach should be flown at the correct speed with wind/gust correction added, but the wind factor should be bled off over the threshold so that the landing is made at Vref plus the gust factor if it exists.

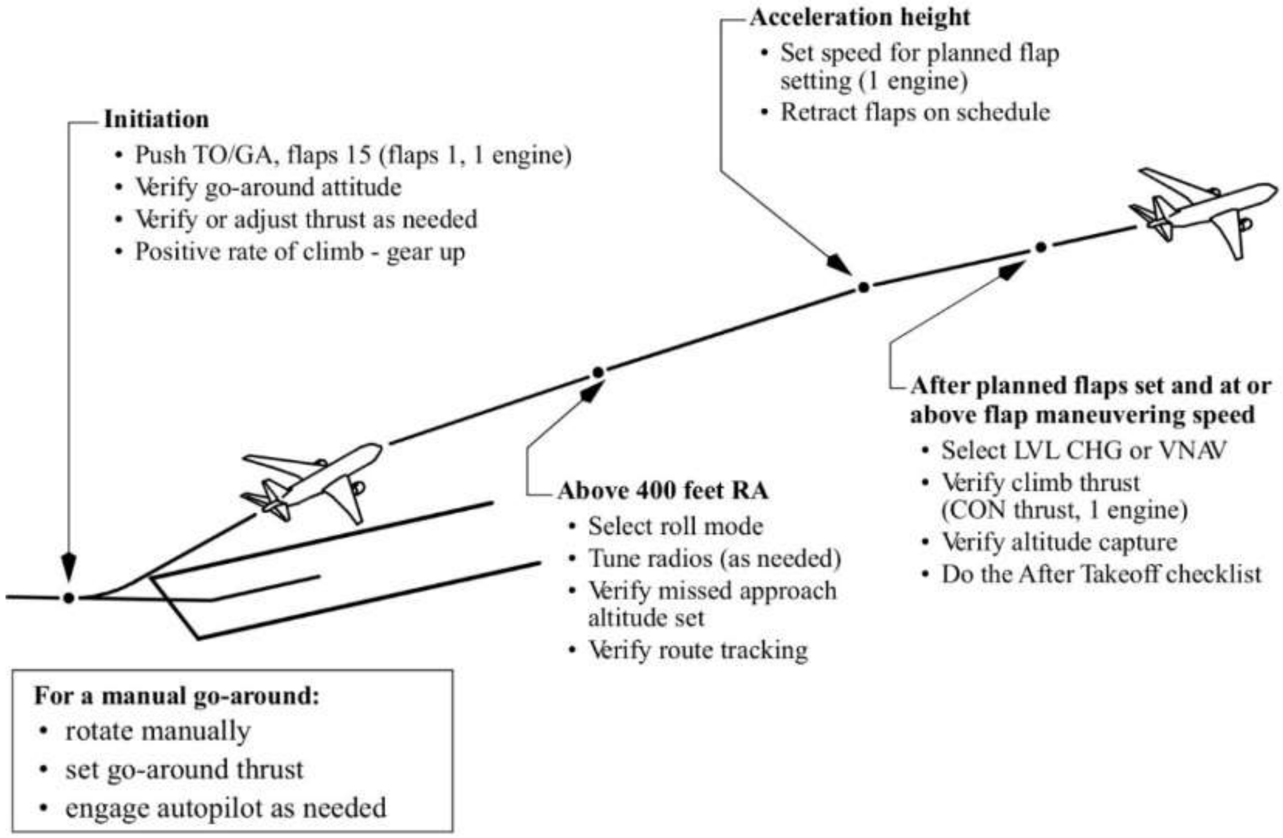
If for any reason the approach path is not maintained and it is likely that the touchdown will occur short of the runway or too far beyond the touchdown zone - A GO-AROUND MUST BE INITIATED

It demonstrates a greater level of professionalism to do a missed approach than to continue with de-stabilized approach.

Following a go-around, the Commander should make an appropriate announcement .

All landings should be made as close as possible to the centerline and the 1000' point.

Once reverse thrust is initiated or the speedbrake deployed after touchdown, a full stop landing must be made.



2.12.5. **Go-Around and Missed Approach Procedure**

Reference: refer to FCOM

2.12.6. **Go-Around after Touchdown**

If a go-around is initiated before touchdown and touchdown occurs, continue with normal go-around procedures. The F/D go-around mode will continue to provide go-around guidance commands throughout then maneuver.

If a go-around is initiated after touchdown but before thrust reverser selection, auto speedbrakes retract and autobrakes disarm as thrust levers are advanced. The F/D go-around mode will not be available until goaround is selected after becoming airborne.

Once reverse thrust is initiated following touchdown, a full stop landing must be made. If an engine stays in reverse, safe flight is not possible.

2.12.7. Low Altitude Level Off - Low Gross Weight

When accomplishing a low altitude level off following a go-around at a low gross weight, the crew should consider the following factors:

- if full go-around thrust is used, altitude capture can occur just after the go-around is initiated due to the proximity of the level off altitude and the high climb rate of the airplane
- the AFDS control laws limit F/D and autopilot pitch commands for comfort
- there may not be enough altitude below the intended level off altitude to complete the normal capture profile and an overshoot may occur unless crew action is taken.

To prevent an altitude and/or airspeed overshoot, the crew should consider doing one or more of the following:

- use the autothrottle
- press TO/GA switch once to command thrust sufficient for a 1,000 to 2,000 fpm climb rate
- if full go-around thrust is used, reduce to climb thrust earlier than normal
- disconnect the AFDS and complete the level off manually if there is a possibility of an overshoot
- if the autothrottle is not available, be prepared to use manual thrust control as needed to manage speed and prevent flap overspeed.

2.12.8. Engine Failure On Final Approach

Should this situation arise, there is a possibility that the airplane would not be able to maintain a normal glideslope with landing flaps under the most adverse conditions of high headwinds and climb performance limited gross weights. The following is therefore given as a guide:

- Upon recognition of engine failure, immediately prepare for go-around. Increase thrust on the operative engine, retract to "FLAPS 15," and accelerate to Vref + 15 knots (B737-500), which is at least equal to flaps 15 Vref. The decision to go around or continue the approach is based on the Commander's judgment, depending mainly on airplane position at engine failure, weather conditions, nature of the failure and runway length/conditions.

If a decision to continue the approach is made, follow the one engine inoperative landing procedures, adjust thrust to maintain glideslope and VREF +15 knots. In the event of a go-around – use flaps 15 initially, maintain VREF + 15. Subsequent flaps retraction should be made at a safe altitude Normally EFFRA in level flight or shallow climb. Retract flaps to position 1, and continue the one engine inoperative go-around. VREF + 15 knots is approximately equal to V2 for flaps 1.

2.12.9. Engine Failure During Go–Around and Missed Approach

If an engine fails during go-around, perform normal Go-Around and Missed Approach procedures. Verify maximum go-around thrust is set. Maintain flaps 15, VREF 30 or 40 + wind correction (5 knots minimum) speed and limit bank angle to 15° until initial maneuvering is complete and a safe altitude is reached.

Accelerate to flap retraction speed by repositioning the command speed to the maneuvering speed for the desired flap setting and adjusting pitch. Retract flaps on the normal flap/speed schedule.

2.13.NORMAL LANDING

2.13.1. Landing Roll

2.13.1.1.Landing Roll Procedure

Reference: refer to FCOM NP.21.44

2.13.1.2.First Officer Is Flying

The Commander will call “60 knots”, at which time the First Officer will reduce reverse thrust smoothly, to be at idle reverse by taxi speed. At this point the Commander will call “I HAVE CONTROL”. The first Officer will smoothly release the brake pedals.

WARNING: After reverse thrust has been initiated, a full stop landing must be made

2.13.2. Landing Techniques /Flight Crew Recommendations

2.13.2.1.Flare and Touchdown

The techniques discussed here are applicable to all landings including one engine inoperative landings, crosswind landings and landings on slippery runways. Unless an unexpected or sudden event occurs, such as windshear or collision avoidance situation, it is not appropriate to use sudden, violent or abrupt control inputs during landing. Begin with a stabilized approach on speed, in trim and on glide path.

When the threshold passes under the airplane nose and out of sight, shift the visual sighting point to the far end of the runway. Shifting the visual sighting point assists in controlling the pitch attitude during the flare. Maintaining a constant airspeed and descent rate assists in determining the flare point. Initiate the flare when the main gear is approximately 20 feet above the runway by increasing pitch attitude approximately 2° - 3°. This slows the rate of descent.

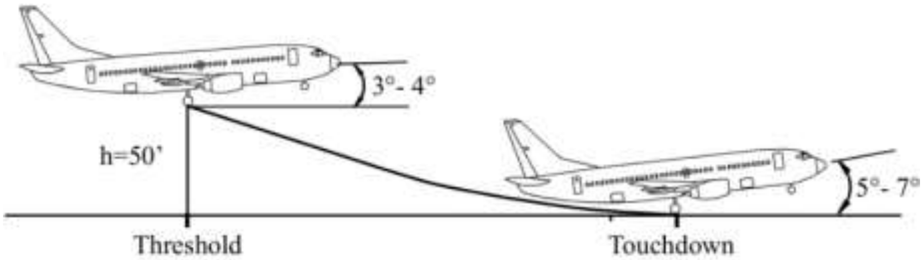
After the flare is initiated, smoothly retard the thrust levers to idle, and make small pitch attitude adjustments to maintain the desired descent rate to the runway. Ideally, main gear touchdown should occur simultaneously with thrust levers reaching idle. A smooth thrust reduction to idle also assists in controlling the natural nose-down pitch change associated with thrust reduction. Hold sufficient back pressure on the control column to keep the pitch attitude constant. A touchdown attitude as depicted in the figure below is normal with an airspeed of approximately VREF plus any gust correction.

Note: Do not trim during the flare or after touchdown. Trimming in the flare increases the possibility of a tailstrike.

2.13.2.2.Landing Flare Profile

The following diagrams use these conditions:

- 3° approach glide path
- flare distance is approximately 1,000 to 2,000 feet beyond the threshold
- typical landing flare times range from 4 to 8 seconds and are a function of approach speed
- airplane body attitudes are based upon typical landing weights, flaps 30, VREF 30 + 5 (approach) and VREF 30 + 0 (landing), and **should be reduced by 1° for each 5 knots above this speed.**



Typically, the pitch attitude increases slightly during the actual landing, but avoid over-rotating. Do not increase the pitch attitude after touchdown; this could lead to a tail strike.

Shifting the visual sighting point down the runway assists in controlling the pitch attitude during the flare. A smooth thrust reduction to idle also assists in controlling the natural nose down pitch change associated with thrust reduction. Hold sufficient back pressure on the control column to keep the pitch attitude constant.

Avoid rapid control column movements during the flare. If the flare is too abrupt and thrust is excessive near touchdown, the airplane tends to float in ground effect. Do not allow the airplane to float; fly the airplane onto the runway. Do not extend the flare by increasing pitch attitude in an attempt to achieve a perfectly smooth touchdown. Remember - a smooth touchdown is not the criterion for a safe landing. Do not attempt to hold the nose wheels off the runway.

2.13.2.3.Bounced Landing Recovery

If the airplane should bounce, hold or re-establish a normal landing attitude and add thrust as necessary to control the rate of descent. Thrust need not be added for a shallow bounce or skip. When a high, hard bounce occurs, initiate a go-around. Apply go-around thrust and use normal go-around procedures. Do not retract the landing gear until a positive rate of climb is established because a second touchdown may occur during the go-around.

Bounced landings can occur because higher than idle thrust is maintained through initial touchdown, disabling the automatic speedbrake deployment even when the speedbrakes are armed. During the resultant bounce, if the thrust levers are then retarded to idle, automatic speedbrake deployment can occur resulting in a loss of lift and nose up pitching moment which can result in a tail strike or hard landing on a subsequent touchdown.

2.13.2.4.**Rejected Landing**

A rejected landing maneuver is trained and evaluated by some operators and regulatory agencies. Although the FCOM/QRH does not contain a procedure or maneuver titled Rejected Landing, the requirements of this maneuver can be accomplished by doing the Go-Around Procedure if it is initiated prior to touchdown.

Reference: Refer to Training Manual "TM" Chapter 5, "Go-Around after Touchdown", for more information on this subject.

2.13.2.5.**Normal Touchdown Attitude**

The following figures illustrate the effect of airspeed on body attitude at touchdown. It shows airplane attitude at a normal touchdown speed for flaps 30 (VREF 30 to VREF 30 - 5 knots). With proper airspeed control and thrust management, touchdown occurs at no less than VREF - 5. The illustration also shows that touchdown at a speed below normal touchdown speed, in this case VREF 30 - 10 knots, seriously reduces aft fuselage runway clearance.

Reference: For Touchdown Body Attitudes and Body Clearance at Touchdown refer to Training Manual "TM", Chapter 6 "Landing /Flare and Touchdown /Normal Touchdown Attitudes and Body Clearance at Touchdown".

Pitch and Roll Limit Conditions

The Ground Contact Angles - Normal Landing figure illustrates body roll angle/pitch angles at which the airplane structure contacts the runway. Prolonged flare increases the body pitch attitude 2° to 3°. When prolonged flare is coupled with a misjudged height above the runway aft body contact is possible. Fly the airplane onto the runway at the desired touchdown point and at the desired airspeed. Do not hold it off and risk the possibility of a tailstrike.

Note: A smooth touchdown is not the criterion for a safe landing.

2.13.2.6.**Landing Roll**

Avoid touching down with thrust above idle since this may establish an airplane nose up pitch tendency and increases landing roll.

After main gear touchdown, initiate the landing roll procedure. If the speedbrakes do not extend automatically move the speedbrake lever to the UP position without delay. Fly the nose wheels smoothly onto the runway without delay. Control column movement forward of neutral should not be required. Do not attempt to hold the nose wheels off the runway. Holding the nose up after touchdown for aerodynamic braking is not an effective braking technique and may result in high nose gear sink rates upon brake application.

To avoid possible airplane structural damage, do not make large nose down control column movements before the nose wheels are lowered to the runway.

To avoid the risk of tailstrike, do not allow the pitch attitude to increase after touchdown. However, applying excessive nose down elevator during landing can result in substantial forward fuselage damage. Do not use full down elevator. Use an appropriate autobrake setting or manually apply wheel brakes smoothly with steadily increasing pedal pressure as required for runway condition and runway length available. Maintain deceleration rate with constant or increasing brake pressure as required until stopped or desired taxi speed is reached.

2.13.2.7.**Speedbrakes**

The speedbrake system consists of individual flight and ground spoiler panels which the pilot can extend and retract by moving the SPEEDBRAKE lever. When the SPEEDBRAKE lever is actuated, all the spoilers extend when the airplane is on the ground and only the flight spoilers extend when the airplane is in the air.

The speedbrakes can be fully raised after touchdown while the nose wheels are lowered to the runway, with no adverse pitch effects. The speedbrakes spoil the lift from the wings, which places the airplane weight on the main landing gear, providing excellent brake effectiveness.

Unless speedbrakes are raised after touchdown, braking effectiveness may be reduced initially as much as 60%, since very little weight is on the wheels and brake application may cause rapid antiskid modulation.

Normally, speedbrakes are armed to extend automatically. Both pilots should monitor speedbrake extension after touchdown. In the event auto extension fails, the speedbrake should be manually extended immediately.

Pilot awareness of the position of the speedbrake lever during the landing phase is important in the prevention of over-run. The position of the speedbrakes should be announced during the landing phase by the PM. This improves the crew's situational awareness of the position of the spoilers during landing and builds good habit patterns which can prevent failure to observe a malfunctioned or disarmed spoiler system.

2.13.2.8.**Directional Control and Braking during Landing Roll**

If the nose wheels are not promptly lowered to the runway, braking and steering capabilities are significantly degraded and no drag benefit is gained. Rudder control is effective to approximately 60 knots. Rudder pedal steering is sufficient for maintaining directional control during the rollout. Do not use the nose wheel steering wheel until reaching taxi speed. In a crosswind, displace the control wheel into the wind to maintain wings level which aids directional control. Perform the landing roll procedure immediately after touchdown. Any delay markedly increases the stopping distance. Stopping distance varies with wind conditions and any deviation from recommended approach speeds.

2.13.2.9.**Wheel Brakes**

Braking force is proportional to the force of the tires on the runway and the coefficient of friction between the tires and the runway. The contact area normally changes little during the braking cycle. The perpendicular force comes from airplane weight and any downward aerodynamic force such as speedbrakes.

The coefficient of friction depends on the tire condition and runway surface, (e.g. concrete, asphalt, dry, wet or icy).

2.13.2.10. **Automatic Brakes**

Use of the autobrake system is recommended whenever the runway is limited, when using higher than normal approach speeds, landing on slippery runways, or landing in a crosswind.

For normal operation of the autobrake system select a deceleration setting.

Settings include:

- MAX: Used when minimum stopping distance is required. Deceleration rate is less than that produced by full manual braking
- “2” or “3”: Should be used for wet or slippery runways or when landing rollout distance is limited
- “1”: These settings provide a moderate deceleration suitable for all routine operations.

Experience with various runway conditions and the related airplane handling characteristics provide initial guidance for the level of deceleration to be selected.

Immediate initiation of reverse thrust at main gear touchdown and full reverse thrust allow the autobrake system to reduce brake pressure to the minimum level. Since the autobrake system senses deceleration and modulates brake pressure accordingly, the proper application of reverse thrust results in reduced braking for a large portion of the landing roll.

The importance of establishing the desired reverse thrust level as soon as possible after touchdown cannot be overemphasized. This minimizes brake temperatures and tire and brake wear and reduces stopping distance on very slippery runways.

The use of minimum reverse thrust as compared to maximum reverse thrust can double the brake energy requirements and result in brake temperatures much higher than normal.

After touchdown, crewmembers should be alert for Autobrake disengagement annunciations. The PM should notify the PF anytime the autobrakes disengage.

If stopping distance is not assured with autobrakes engaged, the PF should immediately apply manual braking sufficient to assure deceleration to a safe taxi speed within the remaining runway.

A table in the PI section of the QRH shows the relative stopping capabilities of the available autobrake selections.

2.13.2.11. **Transition to Manual Braking**

The speed at which the transition from autobrakes to manual braking is made depends on airplane deceleration rate, runway conditions and stopping requirements. Normally the speedbrakes remain deployed until taxi speed, but may be stowed earlier if stopping distance within the remaining runway is assured.

When transitioning to manual braking, use reverse thrust as required until taxi speed. The use of speedbrakes and reverse thrust is especially important when nearing the end of the runway where rubber deposits affect stopping ability.

When transitioning from the autobrake system to manual braking, the PF should notify the PM. Techniques for release of autobrakes can affect comfort and stopping distance. These techniques are:

- stow the speedbrake handle. When stopping distance within the remaining runway is assured, this method provides a smooth transition to manual braking, is effective before or after thrust reversers are stowed, and is less dependent on manual braking technique
- smoothly apply brake pedal force as in a normal stop, until the autobrake system disarms. Following disarming of the autobrakes, smoothly release brake pedal pressure. Disarming the autobrakes before coming out of reverse thrust provides a smooth transition to manual braking
- manually position the autobrake selector off (normally done by the PM at the direction of the PF).

2.13.2.12. **Manual Braking**

The following technique for manual braking provides optimum braking for all runway conditions:

The pilot’s seat and rudder pedals should be adjusted so that it is possible to apply maximum braking with full rudder deflection.

Immediately after main gear touchdown, smoothly apply a constant brake pedal pressure for the desired braking. For short or slippery runways, use full brake pedal pressure.

- do not attempt to modulate, pump or improve the braking by any other special techniques
- do not release the brake pedal pressure until the airplane speed has been reduced to a safe taxi speed
- the antiskid system stops the airplane for all runway conditions in a shorter distance than is possible with either antiskid off or brake pedal modulation.

The antiskid system adapts pilot applied brake pressure to runway conditions by sensing an impending skid condition and adjusting the brake pressure to each individual wheel for maximum braking. When brakes are applied on a slippery runway, several skid cycles occur before the antiskid system establishes the right amount of brake pressure for the most effective braking.

If the pilot modulates the brake pedals, the antiskid system is forced to readjust the brake pressure to establish optimum braking. During this readjustment time, braking efficiency is lost. Low available braking coefficient of friction on extremely slippery runways at high speeds may be interpreted as a total antiskid failure. Maintain steadily increasing brake pressure, allowing the antiskid system to function at its optimum.

Although immediate braking is desired, manual braking techniques normally involve a four to five second delay between main gear touchdown and brake pedal application even when actual conditions reflect the need for a more rapid initiation of braking. This delayed braking can result in the loss of 800 to 1,000 feet of runway. Directional control requirements for crosswind conditions and low visibility may further increase the delays. Distractions arising from a malfunctioning reverser system can also result in delayed manual braking application.

2.13.2.13. **Braking with Antiskid Inoperative**

When the antiskid system is inoperative, the following techniques apply:

- ensure that the nose wheels are on the ground and the speedbrakes are extended before applying the brakes
- initiate wheel braking using very light pedal pressure and increase pressure as ground speed decreases
- apply steady pressure and DO NOT PUMP the pedals.

Flight testing has demonstrated that braking effectiveness on a wet grooved runway is similar to that of a dry runway. However caution must be exercised when braking on any wet, ungrooved portions of the runway with antiskid inoperative to avoid tire failure.

2.13.2.14. **Reverse Thrust Operation**

Awareness of the position of the forward and reverse thrust levers must be maintained during the landing phase. Improper seat position as well as long sleeved apparel may cause inadvertent advancement of the forward thrust levers, preventing movement of the reverse thrust levers.

The position of the hand should be comfortable, permit easy access to the autothrottle disconnect switch, and allow control of all thrust levers, forward and reverse, through full range of motion.

Note: Reverse thrust is most effective at high speeds.

After touchdown, with the thrust levers at idle, rapidly raise the reverse thrust levers up and aft to the interlock position, then to the number 2 reverse thrust detent. Conditions permitting, limit reverse thrust to the number 2 detent. The PM should monitor engine operating limits and call out any engine operational limits being approached or exceeded, any thrust reverser failure, or any other abnormalities.

Maintain reverse thrust as required, up to maximum, until the airspeed approaches 60 knots. At this point start reducing the reverse thrust so that the reverse thrust levers are moving down at a rate commensurate with the deceleration rate of the airplane. The thrust levers should be positioned to reverse idle by taxi speed, then to full down after the engines have decelerated to idle. The PM should call out 60 knots to assist the PF in scheduling the reverse thrust. The PM should also call out any inadvertent selection of forward thrust as reverse thrust is cancelled. If an engine surges during reverse thrust operation, quickly select reverse idle on both engines.

2.13.2.15. **Reverse Thrust - Engine Inoperative**

Asymmetrical reverse thrust may be used with one engine inoperative. Use normal reverse thrust procedures and techniques with the operating engine. If directional control becomes a problem during deceleration, return the thrust lever to the reverse idle detent.

2.13.2.16. **Crosswind Landings**

The crosswind guidelines shown below were derived through flight test data, engineering analysis and flight simulator evaluations. These crosswind guidelines are based on steady wind (no gust) conditions and include all engines operating and engine inoperative. Gust effects were evaluated and tend to increase pilot workload without significantly affecting the recommended guidelines.

2.13.2.16.1. ***Crosswind Landing Techniques***

Three methods of performing crosswind landings are presented. They are the de-crab technique (with removal of crab in flare), touchdown in a crab, and the sideslip technique. Whenever a crab is maintained during a crosswind approach, offset the flight deck on the upwind side of centerline so that the main gear touches down in the center of the runway.

2.13.2.16.2. ***De-Crab During Flare***

The objective of this technique is to maintain wings level throughout the approach, flare, and touchdown. On final approach, a crab angle is established with wings level to maintain the desired track. Just prior to touchdown while flaring the airplane, downwind rudder is applied to eliminate the crab and align the airplane with the runway centerline.

As rudder is applied, the upwind wing sweeps forward developing roll. Hold wings level with simultaneous application of aileron control into the wind. The touchdown is made with cross controls and both gear touching down simultaneously. Throughout the touchdown phase upwind aileron application is utilized to keep the wings level.

2.13.2.16.3. ***Touchdown in Crab***

The airplane can land using crab only (zero sideslip) up to the landing crosswind guideline speeds. (See the landing crosswind guidelines table, Training Manual “TM”).

On dry runways, upon touchdown the airplane tracks toward the upwind edge of the runway while de-crabbing to align with the runway. Immediate upwind aileron is needed to ensure the wings remain level while rudder is needed to track the runway centerline. The greater the amount of crab at touchdown, the larger the lateral deviation from the point of touchdown. For this reason, touchdown in a crab only condition is not recommended when landing on a dry runway in strong crosswinds.

On very slippery runways, landing the airplane using crab only reduces drift toward the downwind side at touchdown, permits rapid operation of spoilers and autobrakes because all main gears touchdown simultaneously, and may reduce pilot workload since the airplane does not have to be decrabbed before touchdown. However, proper rudder and upwind aileron must be applied after touchdown to ensure directional control is maintained.

2.13.2.16.4. ***Sideslip (Wing Low)***

The sideslip crosswind technique aligns the airplane with the extended runway centerline so that main gear touchdown occurs on the runway centerline.

The initial phase of the approach to landing is flown using the crab method to correct for drift. Prior to the flare the airplane centerline is aligned on or parallel to the runway centerline. Downwind rudder is used to align the longitudinal axis to the desired track as aileron is used to lower the wing into the wind to prevent drift. A steady sideslip is established with opposite rudder and low wing into the wind to hold the desired course.

Touchdown is accomplished with the upwind wheels touching just before the downwind wheels. Overcontrolling the roll axis must be avoided because overbanking could cause the engine nacelle or outboard wing flap to contact the runway.

Properly coordinated, this maneuver results in nearly fixed rudder and aileron control positions during the final phase of the approach, touchdown, and beginning of the landing roll. However, since turbulence is often associated with crosswinds, it is often difficult to maintain the cross control coordination through the final phase of the approach to touchdown.

If the crew elects to fly the sideslip to touchdown, it may be necessary to add a crab during strong crosswinds. Main gear touchdown is made with the upwind wing low and crab angle applied. As the upwind gear touches first, a slight increase in downwind rudder is applied to align the airplane with the runway centerline. At touchdown, increased application of upwind aileron should be applied to maintain wings level.

2.14.POST LANDING

2.14.1. After Landing Procedure

Reference: refer to FCOM NP.21.45

2.14.2. Shutdown Procedure

Reference: refer to FCOM NP.21.47

2.14.3. Secure Procedure

Reference: refer to FCOM NP.21.49

In addition to the FCOM procedure, the flight crew shall perform the following:

- Commander will complete the LOG BOOK and sign it.
- When there are persons remaining on board, the pilots will not leave the aircraft unattended with APU running.
- Perform a general exterior inspection with emphasis on tire and engine condition. Damage or other difficulties will be entered in the log book and maintenance notified prior to your next flight or leaving the airport.
- For security reason during overnight stop or prolong stop with airplane unattended, close air conditioning main outflow valve by placing mode selector to MAN AC and FLT/GRD switch to full close.
- Return air conditioning mode selector to AUTO position. (Allows to resume normal automatic operation of main outflow valve when electrical power is available).
- Do not leave the Cockpit until you have stowed all maps and charts in their correct order.
- Remove coffee cups and old "MET' reports, etc. When leaving your seat, make sure the LAP BELTS are placed on the seat cushion.
- In short, leave the cockpit nice and tidy for the next flight crew.

2.15.OPERATION ON WET AND CONTAMINATED RUNWAYS

Reference: refer to FCOM Ch.SP.Sec. 16 / RUNWAY ANALYSIS .

2.16.MNPS OPERATIONS IN NAT HLA

See details in MNPS Manual FO.REG-06, which is an integral part of the Operations Manual of “Aircompany Constanta” PrJSC and is set out in a separate documenent.

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3. ABNORMAL & EMERGENCY PROCEDURES

3.1. Introduction

This chapter is the primary reference for handling all emergency and abnormal situations that could reasonably be expected to occur. It contains the emergency and abnormal checklist following by amplified procedures further describing checklist steps.

Aircompany ensures that the contents of the Abnormal and Emergency Procedures are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.

The abnormal and emergency procedures and checklists (including call outs) are contained in the QRH/FCOM.

Emergency is a condition which affects the safety in such a way that continuation of a flight is seriously endangered. Such emergencies shall be handled according to the policies and procedures in this subsection insofar as the circumstances of an emergency situation do not require deviation there from.

It must be understood that it is impracticable to establish rules governing every possible situation. All personnel concerned are therefore expected to act according to their best judgment in each individual case.

Depending upon the circumstances, the commander will be able to consider all or only part of the following. It is up to his good judgment to set the priorities necessary to safety terminate a flight.

The general safety aspect considered first:

- Technical condition of the aircraft, actual gross weight, remaining fuel on board;
- Terrain clearance requirements;
- En-route weather (wind, temperature, icing, thunderstorms, etc.), Route and aerodrome facilities.

3.1.1. Non-Normal Situation Guidance’s

When a non-normal situation occurs, the following guidelines apply:

- **NON-NORMAL RECOGNITION:** The crewmember recognizing the malfunction calls it out clearly and precisely.
- **MAINTAIN AIRPLANE CONTROL:** It is mandatory that the Pilot Flying (PF) fly the airplane while the Pilot Monitoring (PM) accomplishes the NNC. Maximum use of the autoflight system is recommended to reduce crew workload.
- **ANALYZE THE SITUATION:** NNCs should be accomplished only after the malfunctioning system has been positively identified. Review all caution and warning lights to positively identify the malfunctioning system(s).

  NOTE: Pilots should don oxygen masks and establish communications anytime oxygen deprivation or air contamination is suspected, even though an associated warning has not occurred.
- **TAKE THE PROPER ACTION:** Although many in-flight non-normal situations require immediate corrective action, difficulties can be compounded by the rate the PF issues commands and the speed of execution by the PM. Commands must be clear and concise, allowing time for acknowledgment of each command prior to issuing further commands. The PF must exercise positive control by allowing time for acknowledgment and execution. The other crewmembers must be certain their reports to the PF are clear and concise, neither exaggerating nor understating the nature of the non-normal situation. This eliminates confusion and ensures efficient, effective, and expeditious handling of the non-normal situation.
- **EVALUATE THE NEED TO LAND:** If the NNC directs the crew to land at the nearest suitable airport, or if the situation is so identified in the QRH, diversion to the nearest airport where a safe landing can be accomplished is required. If the NNC or the Checklist Introduction do not direct landing at the nearest suitable airport, the pilot must determine if continued flight to destination may compromise safety.

3.1.2. Troubleshooting

Troubleshooting can be defined as taking steps beyond the published checklist in an effort to improve or correct a non-normal condition. Examples of this are:

- attempting to reset a system, or cycling a circuit breaker when not prescribed by the NNC;
- using maintenance-level information to dictate crew actions;
- use of switches and controls intended only for maintenance.

Troubleshooting is rarely helpful and has caused further loss of system function or failure, and in some cases, accidents and incidents. The crew should consider additional actions beyond the checklist only when completion of the published checklist steps clearly result in an unacceptable situation. In the case of airplane controllability problems when a safe landing is considered unlikely, airplane handling evaluations with gear, flaps or speedbrakes extended may be appropriate. Also, attempting to free jammed flight controls should only be attempted if the airplane cannot be safely landed with the existing condition and then, according to the NNC to the extent possible.

Crew distraction, caused by preoccupation with troubleshooting, has been a key factor in fuel starvation and CFIT accidents. Boeing recommends completion of the NNC as published whenever possible, in particular for flight control malfunctions that are addressed by a NNC. Guidance for situations beyond the scope of the non-normal checklist is provided later in this chapter.

3.1.3. Approach and Landing

When a non-normal situation occurs, a rushed approach can often complicate the situation. Unless circumstances require an immediate landing, complete all corrective actions before beginning the final approach.

For some non-normal conditions, the possibility of higher airspeed on approach, longer landing distance, a different flare picture or a different landing technique should be considered.

Plan an extended straight-in approach with time allocated for the completion of any lengthy NNC steps such as the use of alternate flap or landing gear extension systems. Arm autobrakes and speedbrakes unless precluded by the NNC.

Note: The use of autobrakes is recommended because maximum autobraking may be more effective than maximum manual braking due to timely application upon touchdown and symmetrical braking. However, the Advisory Information in the PI chapter of the QRH provides Non-normal Configuration Landing Distance data based upon the use of maximum manual braking. When used properly, maximum manual braking provides the shortest stopping distance.

Fly a normal glide path and attempt to land in the normal touchdown zone. After landing, use available deceleration measures to bring the airplane to a complete stop on the runway. The captain must determine if an immediate evacuation should be accomplished or if the airplane can be safely taxied off the runway.

3.1.4. **Landing at the Nearest Suitable Airport**

"Plan to land at the nearest suitable airport" is a phrase used in the QRH. This section explains the basis for that statement and how it is applied.

In a non-normal situation, the pilot-in-command, having the authority and responsibility for operation and safety of the flight, must make the decision to continue the flight as planned or divert. In an emergency situation, this authority may include necessary deviations from any regulation to meet the emergency. In all cases, the pilot-in-command is expected to take a safe course of action.

The QRH assists flight crews in the decision making process by indicating those situations where "landing at the nearest suitable airport" is required. These situations are described in the Checklist Introduction or the individual NNC.

The regulations regarding an engine failure are specific. Most regulatory agencies specify that the pilot-in-command of a twin engine airplane that has an engine failure or engine shutdown shall land at the nearest suitable airport at which a safe landing can be made. A suitable airport is defined by the operating authority for the operator based on guidance material, but in general must have adequate facilities and meet certain minimum weather and field conditions. If required to divert to the nearest suitable airport (twin engine airplanes with an engine failure), the guidance material also typically specifies that the pilot should select the nearest suitable airport "in point of time" or "in terms of time". In selecting the nearest suitable airport, the pilot-in-command should consider the suitability of nearby airports in terms of facilities and weather and their proximity to the airplane position. The pilot-in-command may determine, based on the nature of the situation and an examination of the relevant factors that the safest course of action is to divert to a more distant airport than the nearest airport. For example, there is not necessarily a requirement to spiral down to the airport nearest the airplane's present position if, in the judgment of the pilot-in-command, it would require equal or less time to continue to another nearby airport. For persistent smoke or a fire which cannot positively be confirmed to be completely extinguished, the safest course of action typically requires the earliest possible descent, landing and evacuation. This may dictate landing at the nearest airport appropriate for the airplane type, rather than at the nearest suitable airport normally used for the route segment where the incident occurs.

3.2. Crew Incapacitation

If either pilot develops a physical condition which could adversely affect the operation of the aircraft, that pilot shall inform the other pilot. The procedure of Flight Crew Incapacitation are determined in Operation Manual Part A sec 8.3.14 and respective FCOM.

3.3. Fire and Smoke Drills

Fire and Smoke Procedures / Drills are explained thru the Air Condition Smoke, APU Fire, Engine Fire, Electrical Smoke or Fire, Smoke Removal and Wheel Well Fire in the QRH, Section Non-Normal Checklists.

Reference: For additional information please refer to FCTM/FCOM.

3.4. Unpressurized and Partially Pressurized Flight

Reference: Please refer to respective FCOM and QRH.

3.5. Exceeding Structural Limits Such as Overweight Landing

Overweight landings may be made with no damage to the Boeing 737 if it is necessary to land above maximum landing weight due to an EMERGENCY SITUATION. The landing should be done at maximum flap setting permitted by the aircraft operating manual and airport analysis. The pilot should make every effort to do a lighter than normal touchdown, without sacrificing runway length.

The technical inspection for a light to medium overweight landing is minor and can be accomplished by a technician in a few minutes.

The pilot should “write up” the overweight landing, the weight at landing and the type of landing in terms of light, moderate or heavy touchdown. The technician will inspect the aircraft according to the procedure in the maintenance manual.

The structural limits of the aircraft can also be exceeded if the pilot employs incorrect rudder techniques. If the pilot reacts to an abrupt roll onset with a large rudder input in the opposite direction, the pilot can induce large amplitude oscillations. These large amplitude oscillations can generate loads that exceed the limit loads and possibly the ultimate loads, which could result in structural damage. Correct pilot technique is advised for both normal and non-normal procedures. Reference for this can be taken from the Boeing Flight Operations Technical Bulletin – Use of Rudder On Transport Category Airplanes, 13th May 2002.

- Overweight landings may be safely accomplished by using normal landing procedures and techniques with no damage to the B737 if it is necessary to land above maximum landing weight due to an EMERGENCY or NON-NORMAL SITUATION.
- The Aircraft Maintenance Manual (AMM) requires a maintenance inspection after any overweight landing.
- The declaration of an emergency is not required solely for an overweight landing, but the situation that caused the overweight landing may necessitate a declaration.
- An overweight landing is generally recommended under the following conditions:
  - A malfunction that seriously affects the airworthiness of the aircraft.
  - A condition where an expeditious landing would reduce to exposure to degrading level of safety.
  - One engine inoperative (a landing must be considered in order to reduce exposure to additional problems with the remaining engine).
  - A serious illness on board requiring immediate medical attention.
- An overweight landing is generally permitted under the following conditions:
  - A landing due to failures not directly affecting the airworthiness of the aircraft.
  - An unplanned diversion.
- An overweight landing is generally not recommended under the following conditions:
  - Complete hydraulic failures affecting braking performance.
  - Tire burst / failure.
  - Flight control troubles that would adversely affect the handling of the aircraft.
- Use of flap 30 rather than flap 40 is recommended to provide increased margin to flap placard speed.
- A Pilot should make an every effort to do a LIGHTER THAN NORMAL TOUCHDOWN without compromising stopping distance.
- Landing distance is normally less than takeoff distance for flaps 30 and 40 landings at all gross weights. However, wet or slippery runway length requirements should be verified from the landing distance charts in the PI chapter of the QRH.
- Brake energy limits will not be exceeded for flaps 30 or 40 landings at all gross weights.
- Autopilots on Boeing airplanes are not certified for automatic landings above maximum landing weight. An automatic approach may be attempted, however the pilot should disengage the autopilot prior to flare height and accomplish a manual landing.

Reference: Please refer to respective FCTM.

3.6. Exceeding Cosmic Radiation Limits

Cosmic or Solar Radiation Detection Equipment

Cosmic or solar radiation detection equipment is only required if an airplane is operated above 15.000 m (49.000 ft).

Aircompany doesn't operate an Airplane above 45 000 ft.

Assessment of Cosmic Radiation

An operator shall take account of the in-flight exposure to cosmic radiation of all crew members while on duty (including positioning) and shall take the following measures for those crew liable to be subject to exposure of more than 1 mSv per year.

1. Assess their exposure
2. Take into account the assessed exposure when organizing working schedules with a view to reduce the doses of highly exposed crew members.
3. Inform the crew members concerned of the health risks their work involves.
4. Ensure that the working schedules for female crew members, once they have notified the operator that they are pregnant, keep the equivalent dose to the fetus as low as can reasonably be achieved and in any case ensure that the dose does not exceed 1 mSv for the remainder of the pregnancy;
5. Ensure that individual records are kept for those crew members who are liable to high exposure. These exposures are to be notified to the individual on an annual basis, and also upon leaving the operator.

The Commander or the pilot to whom conduct of the flight has been delegated shall initiate a descent as soon as practicable when the limit values of cosmic radiation dose rate specified in the Operations Manual are exceeded.

In order to show compliance with statement above, an operator should assess the likely exposure for crew members so that he can determine whether or not action to comply with (2), (3),(4) and (5) will be necessary.

A. Assessment of exposure level can be made by the method described below, or other method acceptable to the Authority:

Table: Hours exposure for effective dose of 1 millisievert (mSv)

Altitude (feet)	Kilometre equivalent	Hours at latitude 60° N	Hours at equator
27.000	8.23	630	1330
30.000	9.14	440	980
33.000	10.06	320	750
36.000	10.97	250	600
39.000	11.89	200	490
42.000	12.80	160	420
45.000	13.72	140	380
48.000	14.63	120	350

Note: This table, published for illustration purposes, is based on the CARI-3 computer program; and may be superseded by updated versions, as approved by the Authority. The uncertainty on these estimates is about ± 20%. A conservative conversion factor of 0-8 has been used to convert ambient dose equivalent to effective dose.

B. Doses from cosmic radiation vary greatly with altitude and also with latitude and with the phase of the solar cycle. Table 1 gives an estimate of the number of flying hours at various altitudes in which a dose of 1 mSv would be accumulated for flights at 60° N and at the equator. Cosmic radiation dose rates change reasonably slowly with time at altitudes used by conventional jet aircraft (i.e. up to about 15 km / 49 000 ft).

C. Table above can be used to identify circumstances in which it is unlikely that an annual dosage level of 1 mSv would be exceeded. If flights are limited to heights of less than 8 km (27 000 ft), it is unlikely that annual doses will exceed 1 mSv. No further controls are necessary for crew members whose annual dose can be shown to be less than 1 mSv.

3.7. Lightning Strikes

Reference: Please refer to respective FCTM.

When flying through clouds and precipitation, static electricity is formed in the aircraft due to friction against the fuselage. This is called precipitation static, and the phenomenon that can be noticed as small sparks on sharp edges is known as "corona". This charge accumulation increases with the square of the speed.

The immediate danger to crew to be injured by lightning is not great, but a lightning strike or static discharge may damage avionics or cause damage to the pitot tubes.

When re-entering smooth air, the various systems should be checked functionally to the extent possible.

- Compare airspeed indication with value derived from power setting, aircraft attitude and altitude. This is to check the operation of pitot heads.
- Functionally test radios, avionics and instruments to the extent possible.
- Compare compass readings.
- Check circuit breaker panel for tripped circuit breakers.
- Perform debriefing after flight if aircraft systems were affected.

3.8. Distress Communications and Alerting ATC to Emergencies

Reference: Please refer to respective FCTM, FCOM and Jeppesen route manual emergency section.

3.9. Engine Failure

Reference: Please refer to respective QRH and FCOM.

3.10. System Failures

Reference: Please refer to respective QRH and FCTM, MNPS Manual FO.REG-06.

3.11. Guidance for Diversion in Case of Serious Technical Failure

Landing at nearest suitable airport is accomplished in the event of:

- Engine failure or fire.
- Wheel Well fire.
- Cabin smoke or fire which cannot be immediately and positively determined to be eliminated or extinguished.
- One hydraulic system remaining.
- One AC power source remaining (i.e. engine or APU generator).
- Any other situation determined by the crew to present a significant adverse effect on safety if flight is continued.

3.12. Ground Proximity Warning

Reference: Please refer to respective FCOM and QRH.

When undue proximity to the ground is detected by any flight crew member or by a ground proximity warning system, the commander or the pilot to which conduct of the flight has been delegated shall ensure corrective action is initiated immediately to establish safe flight conditions.

3.13.TCAS Warning

General

- TCAS II will generate RAs in 1000-foot level-off encounters if aircraft approach their cleared levels with high vertical rates.
- All RAs must be followed even though they may appear as operationally unnecessary.
- RAs caused by high vertical rates can be disruptive for ATC and cause unnecessary workload to flight crews.

Procedure

Unless otherwise specified in an ATC instruction, to avoid unnecessary ACAS II resolution advisories in aircraft at or approaching adjacent altitudes or flight levels, the below mentioned procedure by which an airplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, should be followed:

- Reduce vertical rates as required according to the recommended limitations below:

Last feet to assigned level (altitude)	Max. vertical rate should not be more than:
3000 ft	3000 ft/min
2000 ft	2000 ft/min
1000 ft	1000 ft/min

- When climbing/descending, maintain situational awareness of aircraft at the adjacent levels.

Reference: For additional information, please refer to respective FCOM and QRH.

3.14.Windshear

Reference: Please refer to respective FCOM and QRH.

3.15.Emergency Landing / Ditching

Reference: Please refer to respective FCTM and QRH.

3.15.1. Emergency Descent, Drift Down Procedures

The following emergency descent, drift down procedures are established along the scheduled routes flown by Aircompany:

- When flying along the route NOLGA-TBN-SIV turn right towards the sea and execute descent followed by landing at the nearest suitable airport, as the situation permits, (LTCG, UGKO, UGTB). After point SIV follow the airway and descent to FL 190 with landing at LTAC, LTFE in case of cabin depressurization consider passenger oxygen supply time 13min, landing must be accomplished as soon as possible.
- When flying along the route SIV-MUT descent to FL 190 and execute landing at LTAU, LTAZ, LTAN, LTAI, in case of cabin depressurization consider passenger oxygen supply time 13 min and execute landing at the nearest airport as soon as possible.
- When executing climb towards the Caucasus mountains along the route DF-LAPTO, before point LAPTO execute left descending turn to FL 150 towards DF and execute landing at UGTB, after point LAPTO descent initially to FL 190 to point POGUL thence continue descent to MSA or 10000 ft and execute landing at URMM, URMT, URRR.
- When executing charter flights along the non-revenue airways above mountainous regions crew has to calculate and set procedures for emergency descent driftdown with approval of Chief Pilot of the Aircompany.

3.16.Departure Contingency Procedure

3.16.1. General Principles

3.16.1.1.Departure Routes (SID's) and Engine Failure Contingency Procedures

Aircompany establishes contingency procedures to provide a safe route, avoiding obstacles, to enable the aeroplane to either comply with the en-route requirements of ARU 682 SAAU, or land at either the aerodrome of departure or at a take-off alternate aerodrome, according ARU 682 SAAU, requirements.

If no special altitudes/levels are promulgated in the SID, procedures are based on a gradient of 3.3% (2.5% slope plus a safety margin of 0.8%). The 3.3% slope starts at the end of the TODA and extends to the point where the SID ends, or to the minimum IFR safe altitude.

3.3% gradient must be achieved in the all-engine case and also in case of engine failure.

If the airplane weight would allow a one engine out gradient of at least 3.3% - under the altitude/temperature conditions -, then a SID could be followed without problems.

If either the weight is higher or a higher gradient is required, an contingency procedure must be developed and followed in case of engine failure.

For airports for which special engine failure procedures are published by state, the SID's may be followed only if so allowed within the engine failure procedure.

Pilots should not accept radar vectors during departure unless:

they are above minimum altitude, required to maintain Obstacle Clearance. This relates to engine failure between V1 and MSA or the end of contingency procedure;

departure route isn't critical with respect to Obstacle Clearance.

3.16.1.2. **Missed Approach Procedures**

Missed approach procedures are based on a minimum gradient of 2,5% unless a higher gradient is specified in missed approach procedure.

For instrument approaches with missed approach climb gradient greater than 2,5% a Flight Crew must verify that the expected landing weight allows achievement of required missed approach climb gradient in one engine inoperative flight.

If the required missed approach gradient can not be achieved for existing landing mass and in engine-out conditions, the Flight Crew shall:

- increase the DA(DH) or MDA(MDH);
- use a contingency procedure.

There are two ways to increase the DA(DH) or MDA(MDH):

- First - use a higher minima for Non-precision Approach which normally is based on climb gradient 2,5% or less.
- Second – Increase DA(DH), MDA(MDH) by 25 feet per every 0,1% of missed approach climb gradient above 2,5%.

  Example: DA 200', Required missed approach gradient 3,2%. Revised DA = 200' + (3,2 - 2,5) x 25' = 200' + (7 x 25') = 375' for gradient 2,5%.

3.16.1.3. **Company Policy**

1. At airports where obstacles in the normal departure reduce allowable weight substantially the airport analysis charts will display an "SPECIAL ENGINE FAILURE PROCEDURE" and the Jeppesen page 10-7 "SPECIAL ENGINE FAILURE PROCEDURE" chart exists to improve all allowable takeoff weight. It also allows the aircraft to climb to the MSA in the quickest time.
2. Those navigation radios to be used during Engine Failure Procedure must be checked prior to departure to ensure they are operational. Creating additional fixes visible on the map may be useful in more clearly defining the emergency turn routing.
3. The PF must brief the PM on the Engine Failure Procedure and it should be clearly visible to both pilots. The briefing must include the MSA that must be attained in emergency.
4. Engine failure flap retraction altitude (EFFRA) is 800' or higher as shown on the Takeoff Analysis chart and must be used in the event of engine failure for flap retraction. EFFRA should be set on altimeter bug for Takeoff.
5. NO ACCELERATION will be done until the aircraft has reached the EFFRA. If the EFFRA has not been reached prior the initial turn then NO ACCELERATION will be done until the aircraft has completed the initial turn. A turn is considered as being a heading change of more than 45 degrees. Additionally some Engine Failure Procedure charts may contain "No Acceleration" instructions which should be followed (usually after aircraft has completed the initial turn and established on prescribed heading). After flap retraction Climb should be continued at Flaps Up Minimum Maneuvering Speed until the MSA for the appropriate sector. The intended procedure and requested altitude should be informed to ATC.

   Example: "Pan-Pan-Pan (Mayday, Mayday, Mayday), UZB 123, after TO engine failure, Continue on RW HDG to 1,5 nm from AYT VOR, then turn right on HDG 180, Climbing 3000 ft."
6. If there is Special Engine Failure Procedure for the Runway – Follow Contingency Procedure.
7. If no Special Engine Failure Procedure chart exists for the runway, then, in the event of engine failure, Runway Heading should be requested, or, if unable, follow SID. Acceleration should be commenced at EFFRA and climb continued until MSA.
8. Pilots should not accept or request radar vectors unless they are at or above MSA (minimum altitude required to maintain obstacle clearance) or the end of contingency procedure.
9. At 400 ft AGL the pilot must call for "memory items" from the ENGINE FIRE or Engine Severe Damage or Separation Checklist, if required.
10. Missed Approach:
    a. Use the appropriate Special Engine Failure Procedure for the runway during a single engine go-around. This should be included in the Approach Briefing.
    b. If no Special Engine Failure Procedure for the runway, crew may ask to follow non- standard Aircompany procedure to climb on RW HDG, but be ready this request may not be approved, and It will be necessary to execute prescribed Missed Approach.

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4. PERFORMANCE

4.1. Introduction

Aircompany ensures that the contents of the PERFORMANCE chapter are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.

Aircompany also ensures that:

- All Boeing 737 aircrafts are operated in accordance with Performance Class A.
- Approved performance Data contained in the AFM is used to determine compliance with the requirements of the appropriate Subpart (G), supplemented as necessary with other data acceptable to the Authority as prescribed in the relevant Subpart (G).
- The contents of the Performance are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.
- That multi-engine airplanes powered by turbo propeller engines with a maximum approved passenger seating configuration of more than 9 or a maximum take-off mass exceeding 5700 kg, and all multi-engine turbojet powered airplanes are operated in accordance with ARU 682 SAAU.
- That the mass of the airplane: (1) At the start of the take-off; or, in the event of in-flight re-planning (2) At the point from which the revised operational flight plan applies, is nit greater than the mass at which the requirements of the appropriate Order 682 SAAU, Attachment can be complied with for the flight to be undertaken, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is provided for in the particular requirements.
- That the approved performance Data contained in the Airplane Flight Manual is used to determine compliance with the requirements of the appropriate, supplemented as necessary with other data acceptable to the Authority as prescribed in the relevant ARU 682 SAAU.

Aircompany takes account of charting accuracy when assessing compliance with the take-off requirements of the applicable ARU 682 SAAU.

4.1.1. **Terminology**

The following terms used in this manual and other supplemented documentation have the following meaning:

1. “Accelerate-stop distance available (ASDA)”. The length of the take-off run available plus the length of stop way, if such stop way is declared available by the appropriate Authority and is capable of bearing the mass of the aircraft under the prevailing operating conditions;
2. “Contaminated runway”. A runway is considered to be contaminated when more than 25 % of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by the following:

a. surface water more than 3 mm (0,125 in) deep, or by slush, or loose snow, equivalent to more than 3 mm (0,125 in) of water;

b. snow which has been compressed into a solid mass which resists further compression and will hold together or break into lumps if picked up (compacted snow); or

c. ice, including wet ice.

3. “Damp runway”. A runway is considered damp when the surface is not dry, but when the moisture on it does not give it a shiny appearance.
4. “Dry runway”. A dry runway is one which is neither wet nor contaminated, and includes those paved runways which have been specially prepared with grooves or porous pavement and maintained to retain “effectively dry” braking action even when moisture is present.
5. “Landing distance available (LDA)”. The length of the runway which is declared available by the appropriate Authority and suitable for the ground run of an aircraft landing.
6. “Take-off distance available (TODA)”. The length of the take-off run available plus the length of the clearway available.
7. “Take-off mass”. The take-off mass of the aircraft shall be taken to be its mass, including everything and everyone carried at the commencement of the take-off run.
8. “Take-off run available (TORA)”. The length of runway which is declared available by the appropriate Authority and suitable for the ground run of an aircraft taking off.
9. “Wet runway”. A runway is considered wet when the runway surface is covered with water, or equivalent, less than specified in subparagraph (a)2. above or when there is sufficient moisture on the runway surface to cause it to appear reflective, but without significant areas of standing water.

The terms “accelerate-stop distance”, “take-off distance”, “take-off run”, “net take-off flight path”, “one engine inoperative en-route net flight path” and “two engines inoperative en-route net flight path” as relating to the aircraft have their meanings defined in the airworthiness requirements under which the aircraft was certificated, or as specified by the Authority if it finds that definition inadequate for showing compliance with the performance operating limitations.

4.1.2. **Take-Off Weight Calculation**

Aircompany ensures that the landing mass of the airplane determined in accordance with ARU 682 SAAU does not exceed the maximum landing mass specified for the altitude and the ambient temperature expected for the estimated time of landing at the destination and alternate aerodrome. All weight and mass data should be calculated in KGs and, when necessary, converted to units of measurement provided by cockpit instruments.

In compliance with the performance and operating regulations, the maximum allowable takeoff and landing operational weights may be less than certificated limits.

The takeoff weight (weight at brake release or at start of takeoff roll) is limited by the most restrictive weight determined from the following five requirements:

- Maximum takeoff weight for altitude and temperature determined from Takeoff Climb Limits charts in AFM Appendix 4. This weight may be increased by using AFM Section 4 if permitted in ENGINE LIMITATIONS Section 1, Pages 5 and 5A of AFM.
- Takeoff field length requirements determined from Field Length Limits, and Runway Length and Vi Adjustments charts in Appendix 4 of AFM. This weight may be increased by using AFM Section 4 of this manual if permitted in ENGINE LIMITATIONS AFM Section 1, Pages 5 and 5A.
- Tire speed based on the Takeoff thrust being used and brake energy limits from either AFM Appendix 4 or AFM Section 4.
- Obstacle clearance and landing operating requirements in AFM Appendix 4. This weight may be increased by using AFM Section 4 of this manual if permitted in ENGINE LIMITATIONS this AFM Section, Pages 5 and 5A.
- Enroute climb weight (For Positive Net Gradients) must be based upon data in AFM Appendix 4.

  The landing weight is limited by the most restrictive weight determined from the following two requirements:
- Landing field length requirements determined from Landing Field Length and Speed chart in AFM Appendix 4 or AFM Section 4.
- Maximum approach and landing climb weight for altitude and temperature determined from Maximum Landing Weight (Climb Limits) charts in AFM Appendix 4. This weight may be increased by using AFM Section 4 if permitted in ENGINE LIMITATIONS AFM Section 1, Pages 5 and 5A.

In compliance with the performance and operating regulations, the maximum allowable takeoff and landing operational weights may be less than certificated limits. The takeoff weight (weight at brake release or at start of takeoff roll) is limited by the most restrictive of the following requirements:

- Maximum takeoff weight for altitude and temperature determined from AFM Takeoff Climb Limits charts, Section 4.
- Takeoff field length requirements determined from AFM Field Length Limits, and Runway Length and Vi Adjustments charts, Section 4.
- Tire speed and brake energy limits, AFM Section 4.
- Obstacle clearance, enroute and landing operating requirements.
- The landing weight is limited by the most restrictive of the following requirements:
  - Landing field length requirements determined from AFM Landing Field Length and Speed chart, AFM Section 4.
  - Maximum approach and landing climb weight for altitude and temperature determined from AFM Maximum Landing Weight (Climb Limits) charts, AFM Section

4.2. Performance Data

The performance data provided in AFM, FCOM, QRH and Airport Analysis can be used without difficulty.

4.2.1. Take-Off Climb Limits: Mass, Altitude, Temperature

Reference: Please refer to respective FCOM/QRH and Airport Analysis.

4.2.2. Take-Off Field Length (Dry-Wet-Contaminated)

Reference: Please refer to respective FCOM/QRH and Airport Analysis.

4.2.3. Net Flight Path Data for Obstacle Clearance Calculation or, where Applicable, Take-Off Flight Path, take-off obstacle clearance shall be in accordance with ARU 682 SAAU

Aircompany takes account of the following:

(1) The mass of the airplane at the commencement of the take-off run;

(2) The pressure altitude at the aerodrome;

(3) The ambient temperature at the aerodrome; and

(4) Not more than 50% of the reported head-wind component or not less than 150% of the reported tailwind component.

For Take-off obstacle clearance Aircompany ensures:

(1) Track changes shall is not allowed up to the point at which the net take-off flight path has achieved a height equal to one half wingspan but not less then but not less than 50 ft above the elevation of the end of the take-off run available. Thereafter up to a height of 400 ft it is assumed that the airplane is banked by no more than 15°. Above 400 ft height bank angles greater than 15°, but more than 25° may be schedules;

(2) Any part of the net take-off flight path in which the airplane is banked by more than 15° must clear all obstacles within the horizontal distances specified in ARU 682 SAAU by a vertical distance of at least 50 ft;

(3) To use special procedures, subject to the approval of the Authority, to apply increased bank angles of not more than 20°

between 200 ft and 400 ft, or not more than 30° above 400 ft .

(4) Adequate allowance is made for the effect of bank angle on operating speeds and flight path including the distance increments resulting from increased operating speeds.

For Take-off obstacle clearance Aircompany also takes account of:

- Cases where the intended flight path does not require track changes of more than 15°.
- Cases where the intended flight path does require track changes of more than 15°.

Reference: Please refer to respective FCOM/QRH and Airport Analysis.

4.2.4. The Gradient Losses for Banked Climb outs

Reference: Please refer to the respective AFM and Airport Analysis.

4.2.5. En-Route Climb Limits

Reference: Please refer to the respective AFM and FCOM.

4.2.6. Approach Climb Limits

Reference: Please refer to the respective AFM, FCOM and Airport Analysis.

4.2.7. Landing Climb Limits

Reference: Please refer to the respective AFM, FCOM and Airport Analysis.

4.2.8. Landing Field Length

Landing Field Length (Dry, Wet, Contaminated) Including the Effects of an In-Flight Failure of a System or Device, if it Affects the Landing Distance

Reference: Please refer to the respective AFM, FCOM/QRH and Airport Analysis.

Note: It shall be ensured that when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be contaminated, the landing distance available must be at least 115 % of the landing distance determined in accordance with AFM and/or QRH.

4.2.9. Break Energy Limits

Reference: Please refer to the respective AFM, FCOM/QRH.

4.2.10. Speed Applicable for the Various Flight Stages (also Considering Wet or Contaminated Runways)

Reference: Please refer to the respective AFM, FCOM/QRH and Airport Analysis.

4.3. Supplementary Data Covering Flights in Icing Conditions.

Reference: Please refer to the respective FCOM.

4.4. Additional Performance Data

Reference: Please refer to the respective FCOM.

4.4.1. All Engine Climb Gradients

Reference: Please refer to the respective AFM , QRH/FCOM and Airport Analysis.

4.4.2. Drift-Down Data

Reference: Please refer to the respective AFM, FCOM and QRH.

4.4.3. Effect of De-Icing/Anti-Icing Fluids

There is no significant effect on the takeoff performance of the de-icing/anti-icing fluids.

Reference: Please refer to the respective AFM and OM-A.

4.4.4. Flight with Landing Gear Down

Reference: Please refer to the respective FCOM/QRH.

4.4.5. Aircrafts With Three or More Engines, One Engine Inoperative Ferry Flights

Not applicable.

4.4.6. Flights Conducted under the Provisions of the CDL

Reference: Please refer to the respective MEL/CDL and AFM.

4.5. Landing dry or wet runways

Reference: Please refer to the respective FCOM/QRH.

Aircompany ensures that:

1. The landing mass of the airplane determined in accordance with ARU 682 SAAU does not exceed the maximum landing mass specified for the altitude and the ambient temperature expected for the estimated time of landing at the destination and alternate aerodrome.
2. For instrument approaches with a missed approach gradient greater than 2,5%the expected landing mass of the airplane allows a missed approach with a climb gradient equal to or greater than the applicable missed approach gradient in the one-engine inoperative missed approach configuration and speed.
3. For instrument approaches with decision heights below 200 ft, the expected landing mass of the of the airplane allows a missed approach gradient of climb, with the critical engine failed and with the speed and configuration used for go-around of at least 2,5%, or the published gradient, whichever is the greater.
4. That when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be determined, the landing distance available must be at least the landing distance determined in accordance with ARU 682 SAAU, or at least 115% of the landing distance determined in accordance with approved contaminated landing distance data or equivalent.

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5. FLIGHT PLANNING

Aircompany ensures that the contents of the Flight Planning are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.

5.1. Data and Instructions for Pre-Flight and In-Flight Planning

For flight planning and preflight briefing Aircompany uses NAVSystem software (see details in OM-A, chapter 8.1.10). The purpose of the NAVSystem software is to generate a planned route for a specific flight to meet the objectives of the customer. These objectives fall into the priority order of safety, cost, fuel or minimum time. The resulting OFP depends on varying parameters such as weather (winds and temperatures), aircraft performance capabilities, zero fuel weight, and the prevailing navigational environment. All mass and weight data provided with NAVSystem software should be given in KGs.

OFP shall be completed for each intended flight. All entries on the operational flight plan are made concurrently and that they are permanent in nature. The copy of the OFP shall be retained in OCC for a period of 3 months.

Flight shall not be commenced unless an ATS flight plan has been submitted, or adequate information has been deposited in order to permit alerting services to be activated if required.

Details of flight planning for MNPS operations are provided in the MNPS Manual FO.REG-06.

Note: For additional information please refer to OM-A, chapter 8.1.10.

5.1.1. Take-Off Alternate Aerodrome

If it would not be possible to return to the departure aerodrome for meteorological or performance reasons, a take-off alternate aerodrome must be selected and specified in the operational flight plan. The take-off alternate aerodrome, in relation to the departure aerodrome, shall be located within one hour flight time at a one-engine-inoperative cruising speed according to the AFM in still air standard conditions based on the actual take-off mass.

5.1.2. Destination Alternate Aerodrome

At least one destination alternate for each IFR flight unless:

1. Both:
   a. the duration of the planned flight from take-off to landing or, in the event of in-flight re-planning in accordance with section 5.2 below, the remaining flying time to destination does not exceed six hours, and
   b. two separate runways are available and usable at the destination aerodrome and the appropriate weather reports or forecasts for the destination aerodrome, or any combination thereof, indicate that for the period from one hour before until one hour after the expected time of arrival at the destination aerodrome, the ceiling will be at least 2 000 ft or circling height + 500 ft, whichever is greater, and the visibility will be at least 5 km; or
2. The destination aerodrome is isolated.
3. Two destination alternate aerodromes must be selected when:
   a. the appropriate weather reports or forecasts for the destination aerodrome, or any combination thereof, indicate that during a period commencing one hour before and ending one hour after the estimated time of arrival, the weather conditions will be below the applicable planning minima; or
   b. no meteorological information is available.

5.1.3. Aerodrome Operating Minima

Reference: please refer to OM-A, chapter 8.1.3.

5.1.4. Planning Minima for IFR flights

Reference: please refer to OM-A, chapter 8.1.3.

5.1.5. Speed Schedules

Reference: Please refer to the respective FCOM/QRH and Airport Analysis.

5.1.6. Power Settings

Reference: Please refer to the respective FCOM and QRH.

5.1.7. Engine Out Operation

Reference: Please refer to the respective FCOM, QRH and FCTM.

5.1.8. Engine Out Procedure in ETOPS Area

Not applicable.

5.2. Method of Calculation Fuel and Oil Needed for Various Stage of Flight

5.2.1. Introduction

A PIC shall not commence a flight unless he is satisfied that the Aircraft carries **NOT LESS** than the planned amount of fuel and oil to complete the flight safely, taking the expected operating conditions into account.

The planning of fuel amounts is based upon procedures contained in the Operations Manual.

All fuel data calculated with NAVSystem software should be provided in KGs. Use OM B sec. 0.2, 0.3. and conversional tables to convert fuel data to units of measurement envisaged by cockpit instruments.

Planning of flights is based on procedures contained in the OM-A sec 8.1.7 and data derived from:

1. data provided by the aircraft manufacturer; and/or
2. current aircraft specific data derived from a fuel consumption monitoring system (refer to OCC fuel consumption monitoring system).

The **operating conditions** under which the flight is to be conducted including:

- Realistic fuel consumption data
- Anticipated airplane masses
- Expected meteorological conditions
- Expected routing and FL
- ATC-procedures and restrictions

Standard calculation of the required fuel shall include:

- Taxi fuel
- Trip fuel
- Contingency Fuel
- Alternate Fuel
- Final Reserve Fuel

Extra Fuel (if so required by PIC, Company or other regulations)

Fuel consumption data and the min. amounts for the appropriate type of airplane may be found in the relevant FCOM.

THE FINAL DECISION ON AMOUNT OF FUEL TO BE CARRIED FOR FLIGHT RESTS WITH PIC.

5.2.2. Definition of the Different Standard Fuel Requirements

TAXI FUEL - shall be the amount expected to be used prior to take-off, taking the local conditions at the departure aerodrome and APU fuel consumption must be taken into account as well after refueling into account.

Standard Taxi Fuel	
B737-300	200 kg

The amount of standard taxi fuel may be increase due to possible long taxi route and holding time up to 300-500 kg for Boeing 737.

The PIC may adjust (increase/decrease) standard taxi fuel to local requirements. Nevertheless, the maximum ramp mass of the Aircraft shall not be exceeded

When operating Aircrafts with an APU, then the

MINIMUM TAXI FUEL - as Company standard - shall never be less than 5 minutes (100 kg for Boeing 737)

TRIP FUEL - the trip fuel must include the fuel for takeoff and climb from aerodrome elevation to initial cruising level/altitude considering the expected departure route, fuel from top of climb to top of descent -including step climbs or descents - along the expected airway routing, fuel from top of descent to the point where the approach procedure is initiated, taking into account the expected arrival procedure, fuel for approach - an allowance of **at least 4 minutes** shall be considered as a Company standard (included in the "descent figures" of the FCOM) - and fuel for the final approach and landing.

Fuel figures presented in the FCOM for the climb include the fuel for takeoff. Descent tables include fuel for descent, approach and landing.

Remarks:

Since it is often difficult to predict the relevant SIDs and STAR, depending on the runway in use for takeoff or landing, the overall route distance may be planned as follows:

- calculate the distance to destination via the **most unfavorable** takeoff runway, departure route, arrival route and landing runway giving **sum "a"**
- calculate the distance to destination via the **most favorable** takeoff runway, departure route, arrival route and landing runway giving **sum "b"**
- use the average between "a" and "b"

Note: When "preferential" ATC routings use "unfavorable" departure and/or arrival routings those distances should be considered.

CONTINGENCY FUEL

At the planning stage, not all factors which could have an influence on the fuel consumption to the destination aerodrome can be foreseen. Therefore, contingency fuel is carried to compensate for items such as:

- Deviations of an individual Aircraft from the expected fuel consumption data;
- Deviations from forecast meteorological conditions; and
- Deviations from planned routings and/or cruising levels/altitudes.

Contingency fuel, which should be the higher of (a) or (b) below:

a. Either:
   1. 5% of the planned trip fuel or, in the event of in-flight replanning, 5% of the trip fuel for the remainder of the flight; or
   2. Not less than 3% of the planned trip fuel or, in the event of in-flight replanning, 3% of the trip fuel for the remainder of the flight, provided that an en-route alternate which should be located within a circle having a radius equal to 20% of the total flight plan distance, the centre of which lies on the planned route at a distance from the destination of 25% of the total flight plan distance, or at least 20% of the total flight plan distance plus 50 nm., whichever is greater, all distances are to be calculated in still air conditions, or
   3. An amount of fuel sufficient for 20 minutes flying time based upon the planned trip fuel consumption provided that the operator has established a fuel consumption monitoring programme (FCMP) for individual Aircrafts and uses valid data determined by means of such a programme for fuel calculation; or
   4. An amount of fuel based on a statistical method approved by the Authority which ensures inappropriate statistical coverage of the deviation from the planned to the actual trip fuel. This method isused to monitor the fuel consumption on each city pair/Aircraft combination and the operator uses this data for a statistical analysis to calculate contingency fuel for that city pair/Aircraft combination.

b. An amount to fly for 5 minutes at holding speed at 1 500 ft (450 m), operations, above the destination aerodrome in Standard Conditions.

Note: The Authority or the Company may require a higher percentage for contingency fuel when a new type of airplane is introduced or when fuel consumption data are unreliable. It is furthermore assumed, that flight planning is either based on computerised flight planning or on recalculated flight plans. When such flight planning services are not available, contingency fuel shall be increased to 10%.

CONTINGENCY FUEL				
Type	**Short Range***	**Long Range** (Note 1)**	**Minimum (Note 2)**	**Maximum (Note 3)**
B737	5%	3%	200 kg	20' trip fuel

Note:

1. A FCMP and Fuel En-route Alternate are required (FEA). If a FCMP or FEA are not available, 5% contingency fuel shall be used.
2. The minimum contingency fuel is the amount of fuel required to fly for 5 minutes at holding speed at 1.500 ft above the destination aerodrome in standard conditions.
3. The maximum contingency fuel is the amount of fuel required to fly for 20 minutes based upon the planned trip fuel consumption.

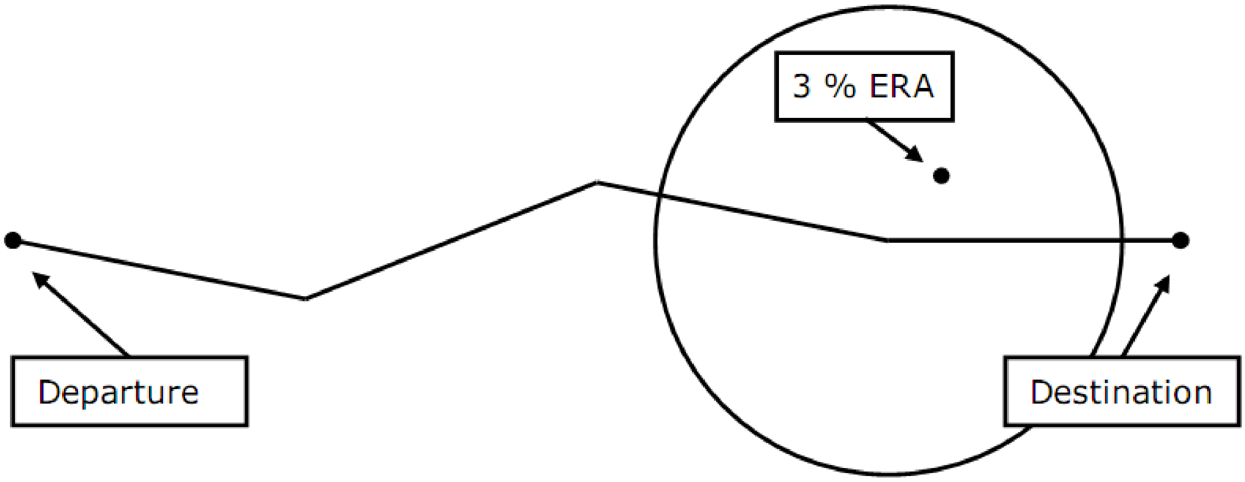
Remark:

* - Short range - Planned airborne time of 4,5 hours or less

** - Long range - Planned airborne time of more than 4,5 hours

Fuel Enroute Alternate Aerodrome (FEA)

A FEA is required for special fuel planning purposes only (3% Contingency Fuel planning). The FEA lies within a circle centered at 75% of the total flight plan distance. The radius of the circle equals 20% of the total flight plan distance.



Example: Total flight plan distance is 4.000 nm, circle lies at 3.000 nm (75%) with a radius of 800 nm (20%).

ALTERNATE FUEL - the alternate fuel must include:

- fuel for missed approach from the applicable MDA/MDH at the destination aerodrome to missed approach altitude via the prescribed missed approach procedure,
- fuel from missed approach altitude to cruising level/altitude,
- fuel from top of climb to top of descent,
- fuel from top of descent to the point where the approach is initiated, taking into account the expected arrival, route,
- fuel for approach - an allowance of at least 4 min. shall be considered as a company standard -
- fuel for final approach and landing.

Remarks:

1. Alternate distances shall be calculated using the same criteria as for the route to destination (see "Remarks" under "Trip Fuel").
2. The alternate tables in the FCOM include the fuel from missed approach point at destinations as well as 4 minutes approach allowance.

FINAL RESERVE FUEL

For all turbine powered (jet or turboprop) airplanes a final reserve fuel shall be calculated to fly for **30 minutes** at holding speed **at 1500 ft MSL ISA** conditions calculated for **the expected landing mass at alternate** (or at destination - if no alternate is required).

EXTRA FUEL - is an amount of fuel which may be carried either for economical reasons (economic tankering) **or at the discretion of the PIC.**

In order to significantly reduce the number of occasions when the frost rises on lower and upper surfaces of the wing with cold fuel on the ground, the following restriction has been place on carriage of economy fuel:

PARAMETERS	
Sector length	Between 1.15 - 4.00 hour
Likely OAT (at destination)	-2°C - +10°C
Precipitation	Drizzle / Rain / Sleet / Wet Snow / Light Freezing Rain / High Humidity*
“DO NOT CARRY ECONOMY FUEL”	

Note:

*Dew point within 2°C of ambient temperature

ADDITIONAL FUEL - when calculating the minimum takeoff fuel for a flight, a possible failure of power-unit(s) or loss of pressurization en-route must be taken into account in the event of such a failure at the most critical point of the route, sufficient fuel must be available (if that amount is not covered in the min takeoff fuel requirements as described above) to proceed to an adequate aerodrome, to hold there for 15 min at 1500 ft AAL and at ISA and land.

MINIMUM TAKEOFF FUEL (TOF)

The amount of fuel required for a flight according fuel planning before take-off.

MINIMUM BLOCK FUEL (BF)

The amount of fuel required for a flight according fuel planning.

5.2.3. **Flights without Alternate**

A=Departure   B= Destination

(Isolated or without alternate)

1. Isolated aerodrome procedure. If an operator’s fuel policy includes planning to an isolated aerodrome for which a destination alternate does not exist, the amount of fuel at departure should include:
    a. Taxi fuel;
    b. Trip Fuel;
    c. Contingency Fuel calculated in accordance with section 5.2.2 OM Part B above;
    d. Additional Fuel if required, but not less than: for Airplanes with turbine engines, fuel to fly for two hours at normal cruise consumption after arriving overhead the destination aerodrome, including final reserve fuel; and
    e. Extra Fuel if required by the PIC.
2. Without Alternate procedure:. If an operator’s fuel policy includes planning to a destination aerodrome for which there are two separate runways and prevailing meteorological conditions 1 hour prior to and 1 hour after an arrival time, allow to execute a landing approach from the appropriate sector of safe altitude (MSA) and landing in visual conditions and planned airborne time not exceed 6 hours, the amount of fuel at departure should include:

Note: the runways are considered, as separate, if they have different procedures of approach based on various NAVAIDs, separate surfaces, which can be crossed, however even in case of blockage one from them, allow to not interrupt flights with another.

a) Taxi fuel;

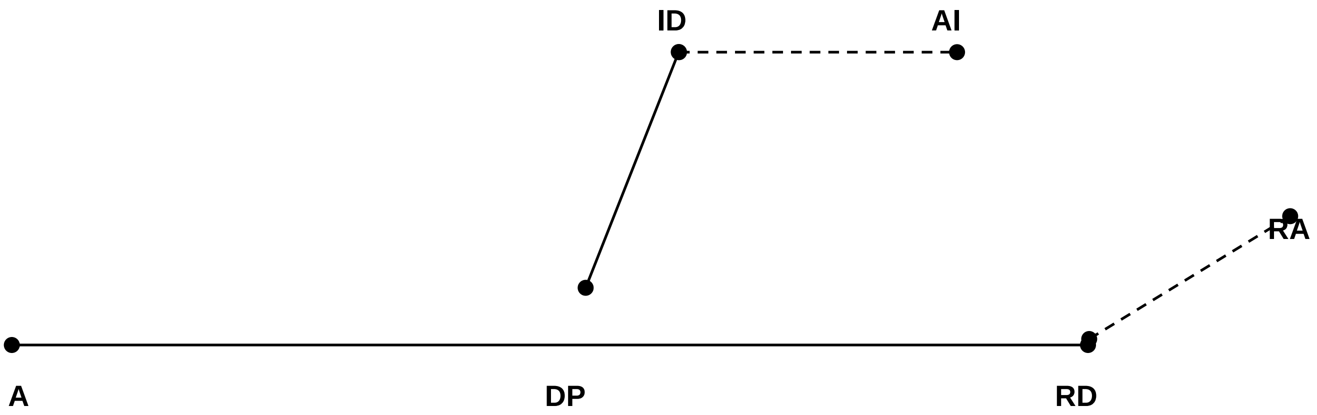
b) Trip Fuel;

c) Contingency Fuel calculated in accordance with section 5.2.2 OM Part B above;

d) Additional Fuel if required, but not less than: for Aircrafts with turbine engines, fuel to fly for **one hours at holding speed at 1 500 ft (450 m) above aerodrome elevation in standard conditions** after arriving overhead the destination aerodrome, including final reserve fuel; and

e) Extra Fuel if required by the PIC.

5.2.3.1. **Decision Point Procedures**



A – Departure

AI – Initial Alternate

DP – Decision Point

ID – Initial Destination

RA – Re-cleared Alternate

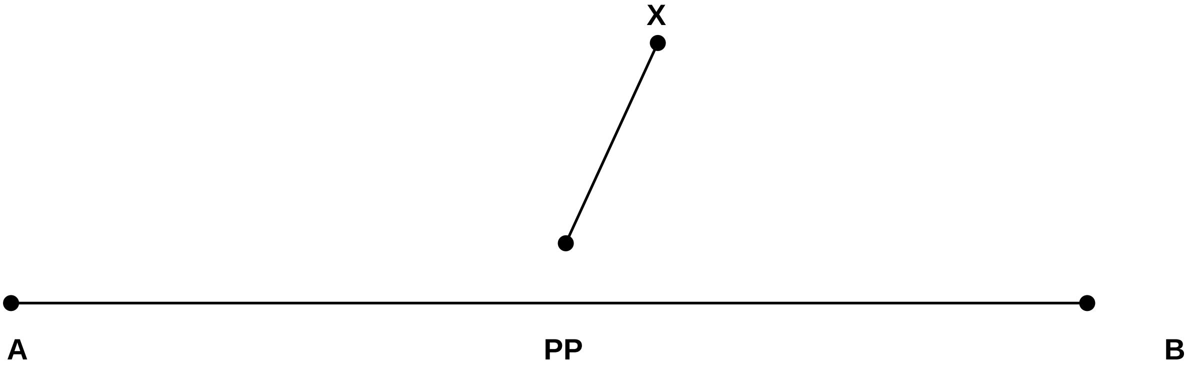
RD – Re-cleared Destination

Decision Point Procedure

If an operator's fuel policy includes planning to a destination aerodrome via a decision point along the route, the amount of fuel should be the greater of 1 or 2 below:

1. The sum of:
    a) Taxy fuel;
    b) Trip fuel to the destination aerodrome, via the decision point;
    c) Contingency fuel equal to not less than 5% of the estimated fuel consumption from the decision point to the destination aerodrome;
    d) Alternate fuel, if a destination alternate is required;
    e) Final reserve fuel;
    f) Additional fuel; and
    g) Extra fuel if required by the PIC; or,
2. The sum of:
    a) Taxi fuel;
    b) The estimated fuel consumption from the departure aerodrome to a suitable en-route alternate, via the decision point;
    c) Contingency fuel equal to not less than 3% of the estimated fuel consumption from the departure aerodrome to the en-route alternate;
    d) Final reserve fuel;
    e) Additional fuel; and
    f) Extra fuel if required by the PIC.

5.2.3.2. **Pre-Determined Point Procedure (Turbine Powered Airplanes)**



A – Departure

B – Destination

PP – Pre-determined Point

X – Alternate Destination

This procedure is applied if a destination alternate is required and the distance between the destination aerodrome and the destination alternate is such that a flight can be routed, via a predetermined point, to one of these aerodromes only. When planning such a flight, both cases have to be taken into consideration.

Pre-determined point procedure. If an operator's fuel policy includes planning to a destination alternate where the distance between the destination aerodrome and the destination alternate is such that a flight can only be routed via a predetermined point to one of these aerodromes, the amount of fuel should be the greater of 1 or 2 below:

1. The sum of:
   a) Taxi Fuel;
   b) Trip Fuel from the departure aerodrome to the destination aerodrome, via the predetermined point;
   c) Contingency Fuel calculated in accordance with section 5.2.2 above;
   d) Additional Fuel if required, but not less than: for Aircrafts with turbine engines, fuel to fly for two hours at normal cruise consumption after arriving overhead the destination aerodrome, including Final Reserve Fuel; and
   e) Extra Fuel if required by the PIC; or
2. The sum of:
   a) Taxi Fuel;
   b) Trip Fuel from the departure aerodrome to the alternate aerodrome, via the predetermined point;
   c) Contingency Fuel calculated in accordance with section 5.2.2 above;
   d) Additional Fuel if required, but not less than: for Aircrafts with turbine engines: fuel to fly for 30 minutes at holding speed at 1 500 ft (450 m) above aerodrome elevation in standard conditions; including Final Reserve Fuel; and
   e) Extra Fuel if required by the PIC.

5.2.3.3. **Fuel Monitoring in Flight**

During flight, crew shall monitor fuel consumption and compare with the actual amount of fuel left. The crew shall log the fuel used and left on the OFP every 1 hour of flight, additionally fuel consumed shall be checked each hour of flight, and logged on the OFP. Actual amount of fuel left indicated by instruments should be converted to KGs using OM-B, sec. 0.2, 0.3

5.2.4. **Fuel Recording/Logging**

OPERATIONAL FLIGHT PLAN

The different amounts of the required extra and additional fuel as explained under OM Part B sec 5.2.2 through OM Part B sec 5.2.5 must be identified on the OFP.

AIRCRAFT TECHNICAL LOG

Any fuel uplift must be entered into the Aircraft Technical Log and Maintenance Report - specifying

- fuel remaining (from previous flight)
- fuel uplift
- total fuel on board

The total fuel on board as shown in the Aircraft Technical Log must never be less than the required minimum takeoff fuel plus the taxi/APU fuel - as calculated for that flight.

5.2.5. **Oil Policy**

The flight should not be commenced, if quantity of oil on airplane does not correspond minimum necessary, determined by a Maintenance Manual, and procedures of the Company.

- At a start from the base airport quantity of oil should be not less:
  - On a Boeing 737-300 with engines CFM56 - 80%
- At a start from the transit airport on base air station quantity of oil should be not less:
  - On a Boeing 737-300 with engines CFM56 - 60%
- The normal operational consumption of oil should be in limits:
  - On a Boeing 737-300 with engines CFM56-2%-8% for 1 hour of flight
- The maximum allowed (maximum permissible) consumption of oil in flight, at which it is necessary to do (make) recording in the technical logbook (TLB) and operation personnel to make a decision makes:
  - On a Boeing 737-300
  - with engines CFM56 > 8% for 1 hour of flight

5.2.6. Fuel Calculations & Recording for MNPS Operations

Details of fuel calculations and recording for MNPS operations are provided in the MNPS Manual FO.REG-06.

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Навмисно залишена незаповненою

TABLE OF CONTENTS ЗМІСТ

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Навмисно залишена незаповненою

6. MASS AND BALANCE

Intro:

Aircompany ensures that the contents of the Mass and Balance are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.

Aircompany ensures that during any phase of operation, the loading, mass and center of gravity of the aircraft complies with the limitations specified in the approved AFM, or the OM if more restrictive.

6.1. General Weight and Balance

Reference: for mass and balance limitations please refer to AFM, chapter 1, “Certificate Limitations”.

6.2. Terminology

Dry Operating Mass

The total mass of the aircraft ready for a specific type of operation excluding all usable fuel and traffic load. This mass includes items such as:

1. Crew and crew baggage;
2. Catering service equipment; and
3. Potable water and lavatory chemicals.

Maximum Zero Fuel Mass

The maximum permissible mass of an aircraft with no usable fuel. The mass of the fuel contained in particular tanks must be included in the zero fuel mass when it is explicitly mentioned in the AFM limitations.

Maximum Structural Landing Mass

The maximum permissible total aircraft mass upon landing under normal circumstances.

Maximum Structural Take-Off Mass

The maximum permissible total aircraft mass at the start of the take-off run.

Traffic Load

The total mass baggage and cargo, including any non-revenue load.

6.3. Calculation System

The centre of gravity is calculated by using an Index System where the individual aircrafts have:

1. Dry Operating Index (DOI).
2. Loaded Index Zero Fuel Mass (LIZFM).
3. Loaded Index Take-off Mass (LITOM).

The Aircompany Load Sheet and Trim Sheet form shall be used. Both the Loaded Index Zero Fuel Mass (LIZFM) and the Loaded Index Take-off Mass (LITOM) must be within the envelope on the Load Sheet and balance chart.

It is shall be ensured that during any phase of operation, the loading, mass and centre of gravity of the aircraft complies with the limitations specified in the approved AFM, or the Operations Manual if more restrictive. In addition to this it must be ensured that:

1. The loading of aircraft is performed under the supervision of qualified personnel.
2. The loading of the freight is consistent with the data used for the calculation of them aircraft mass and balance.
3. Additional structural limits such as the floor strength limitations, the maximum load per running metre, the maximum mass per cargo compartment, and/or the maximum seating limits are complied.

Reference: For additional information please refer to chapter GOM.

6.4. Information and Instruction for Completion of the Mass & Balance Document

Aircompany uses a standard IATA Load Sheet and Aircompany Trim Sheet which are designed in accordance to the standards of IATA in order to simplify the contacts with handling agents.

All masses on the Load Sheet and Trim Sheet for all Aircompany aircrafts must be calculated in KGs.

Aircompany determines the mass of all operating items and crew members included in the aircraft dry operating mass by weighing or by using standard masses following company AHM (Aircraft Handling Manual). The influence of their position on the aircraft center of gravity is determined following Trim Sheet.

Actual weight must be used when taking freight or ballast into account. The weight of the fuel load must be calculated using either actual density, or a standard density value of 0.8.

Mass and balance documentation shall be established prior to each flight specifying the load and its distribution.

Content of the Mass and Balance Documentation

Content of the mass and balance documentation shall be with accordance to EU-Annex IV – Part-CAT (CAT.POL.MAB.105).

Determination of the Dry Operating Mass of on Aircraft

Determination of the Dry Operating Mass of the Aircraft shall be in accordance with the Aircompany Aircraft Handling Manual (AHM) and OM-A, sec. 8.1.8.

6.4.1. Mass and Balance Calculation Software

Aircompany uses the EVIONICA mass and balance calculation software provided by Evionica sp. z o.o.

Mass and balance documentation produced using EVIONICA software:

- Load Sheet & Trim Sheet (form FO.FORM-16);
- Onloading & Offloading Instructions (form FO.FORM-15).

Load Sheet and Trim Sheet form FO.FORM-16 output data should include the following information:

1. Aircraft registration marks and aircraft type;
2. Flight identification, number and date;
3. Name of the PIC;
4. Name of the person who prepared the document;
5. Dry operating mass and the corresponding CG of the aircraft;
6. Mass of the fuel at take-off and the mass of trip fuel;
7. Mass of consumables other than fuel, if applicable;
8. Load components including additional crew, baggage, freight and ballast;
9. Take-off mass, landing mass and zero fuel mass;
10. Applicable aircraft CG positions;
11. The limiting mass and CG values.

Onloading and Offloading Instructions form FO.FORM-15 should include the following data:

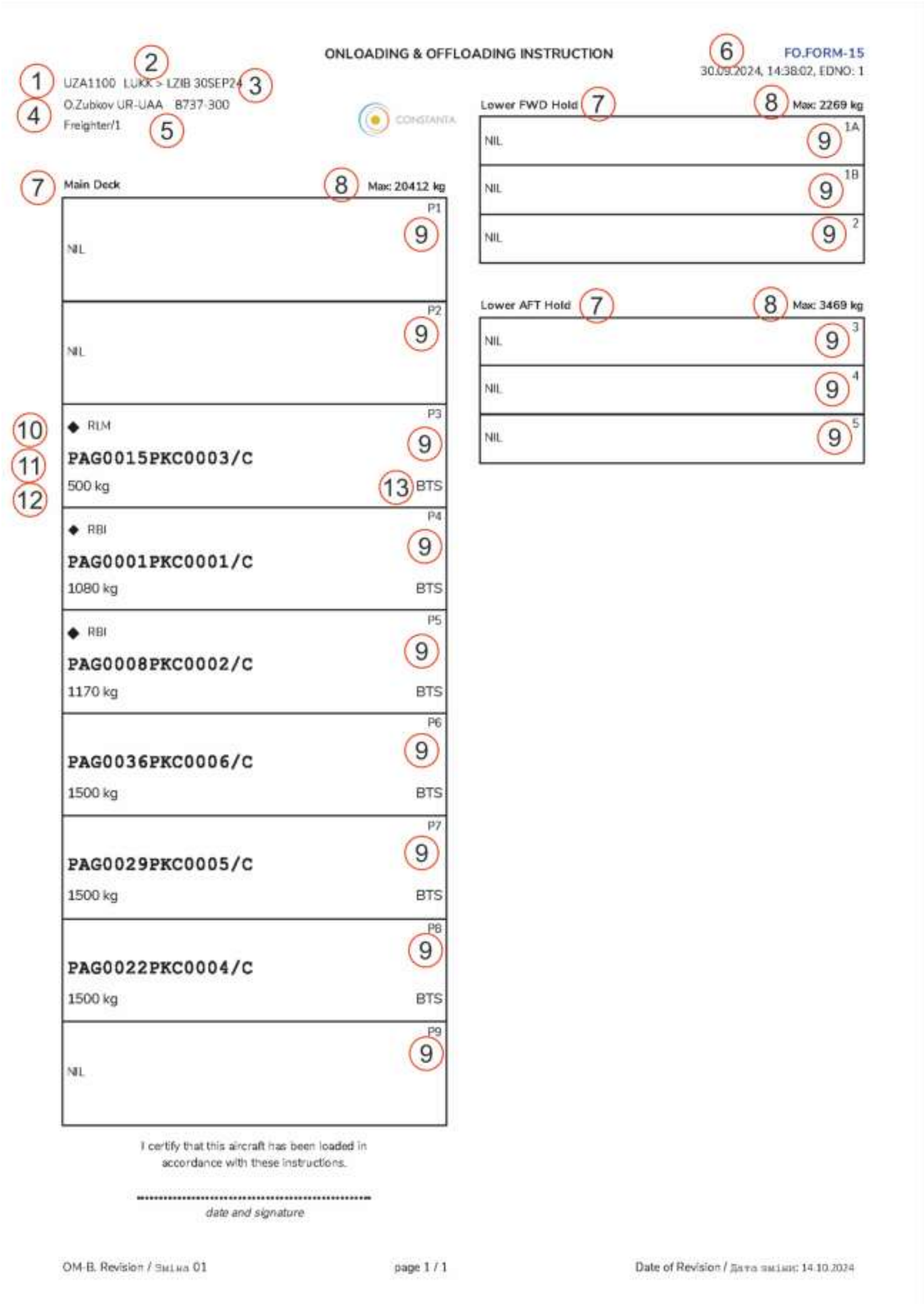
1. Flight identification, number and date;
2. Flight route;
3. Date of flight;
4. Name of a person checked the data;
5. Aircraft registration marks and aircraft type;
6. Date and time the form have been calculated;
7. Name of cargo hold;
8. Cargo hold capability;
9. Cargo hold section number;
10. Type of cargo;
11. Cargo specifications;
12. Cargo weight;
13. Service information.

An example of a Load Sheet & Trim Sheet form FO.FORM-16 and Onloading & Offloading Instructions form FO.FORM-15 generated by the EVIONICA software is shown on the next pages.

An example of a Load Sheet & Trim Sheet form FO. FORM-16 generated by the EVIONICA software

```
CONSTANTA LOADSHEET & TRIMSHEET                        FO.FORM-16

L O A D S H E E T             CHECKED (4)     APPROVED (3)    EDNO
ALL WEIGHTS IN KILOGRAMS (2)  O.Zubkov        V.Tykhonenko     1F

FROM/TO    FLIGHT    A/C REG VERSION (1)   CREW    DATE (2)    TIME
LZIB LUKK  UZA226    UR-UAA   B737F        3/1     04 OCT 24   1608

                               WEIGHT
LOAD IN COMPARTMENTS            7300                              (8)

DISTRIBUTION
MAIN DECK                             LOWER DECK
             P1       0                         1A       0
             P2      50                  1B     0
             P3     500                         2        0
             P4    1080                         3        0
             P5    1170                  4      0
             P6    1500                         5        0
             P7    1500
             P8    1500
             P9       0

BASIC OPERATIONAL WEIGHT   31268
******************************
ADDITIONAL CREW              160
SERVICE ADJUSTMENTS            0  (8)
BALLAST FUEL                   0
DRY OPERATING WEIGHT       31428  (5)
******************************
TOTAL TRAFFIC LOAD          7300  (8)
ZERO FUEL WEIGHT ACTUAL    38728 MAX 48307          ADJ
******************************                (11)
TAXI FUEL                    200
TAKE OFF FUEL               9000  (6)
TAXI WEIGHT ACTUAL         47928 MAX 61461          ADJ
******************************
(9) TAKE OFF WEIGHT ACTUAL 47728 MAX 61234          ADJ
******************************
TRIP FUEL                   4500  (7)
(9) LANDING WEIGHT ACTUAL  43228 MAX 51709      L   ADJ

BALANCE AND SEATING CONDITIONS
DOI      10.93                    FWD LIMIT      AFT LIMIT
LIZFW    42.33   MACZFW   18.37   6.33           29.15
LITXW    42.86   MACTXW   18.36
LITOW    42.65   MACTOW   18.26   6.08           29.13

UNDERLOAD BEFORE LMC        8481

CAPTAINS INFORMATION/NOTES
FLAPS 1 AND 5 STAB TO 4.7 NOSE UP
BI 13.27
LATERAL IMBALANCE: L 3650 / R 3650 / DIFF 0
PANTRY CODE No pantry
NOTOC: YES

SI
LILAW    38.94   MACLAW   16.48                (10)
-P2/AVI-P3/RLM-P4/RBI-P5/RBI

OM-B. Revision/Зміна 01 Date of Revision/Дата зміни: 14.10.2024
                    POWERED BY EVIONICA
```

An example of a Onloading & Offloading Instructions form FO.FORM-15 generated by the EVIONICA software



ONLOADING & OFFLOADING INSTRUCTION

FO.FORM-15

30.09.2024, 14:38:02, EDNO: 1

UZA1100 LUKK > LZIB 30SEP24

O.Zubkov UR-UAA B737-300

Freighter/1

CONSTANTA

Main Deck — **Max: 20412 kg**

P1	NIL
P2	NIL
P3	◆ RLM **PAG0015PKC0003/C** 500 kg — BTS
P4	◆ RBI **PAG0001PKC0001/C** 1080 kg — BTS
P5	◆ RBI **PAG0008PKC0002/C** 1170 kg — BTS
P6	**PAG0036PKC0006/C** 1500 kg — BTS
P7	**PAG0029PKC0005/C** 1500 kg — BTS
P8	**PAG0022PKC0004/C** 1500 kg — BTS
P9	NIL

Lower FWD Hold — **Max: 2269 kg**

1A	NIL
1B	NIL
2	NIL

Lower AFT Hold — **Max: 3469 kg**

3	NIL
4	NIL
5	NIL

I certify that this aircraft has been loaded in accordance with these instructions.

....

date and signature

OM-B. Revision / Зміна 01 page 1 / 1 Date of Revision / Дата зміни: 14.10.2024

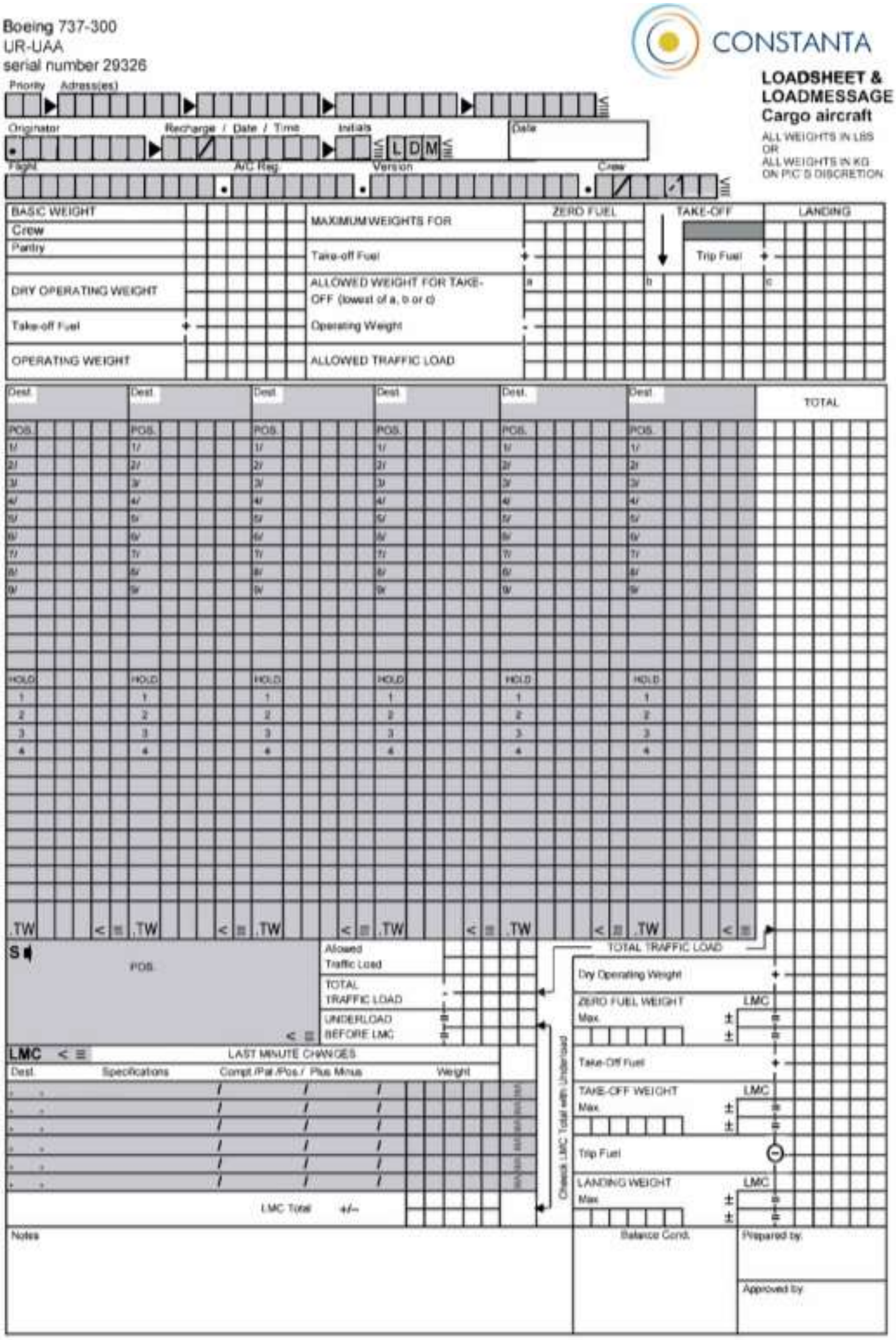
6.4.2. Mass and Balance documentation for manual calculations

In case that the EVIONICA software is not available for use the following form should be used for mass and balance documentation for manual calculations:

1. Load Sheet & Load Message. Cargo aircraft;
2. Treem Sheet;
3. Loading Instructions Report / LIR.

The listed above forms are given below.

Load sheet



Boeing 737-300
UR-UAA
serial number 29326

CONSTANTA
LOADSHEET & LOADMESSAGE
Cargo aircraft
ALL WEIGHTS IN LBS OR ALL WEIGHTS IN KG ON PIC'S DISCRETION

Priority Adress(es)
Originator Recharge / Date / Time Initials LDM Date
Flight A/C Reg. Version Crew

BASIC WEIGHT
Crew
Pantry
DRY OPERATING WEIGHT
Take-off Fuel +
OPERATING WEIGHT

MAXIMUM WEIGHTS FOR — ZERO FUEL / TAKE-OFF / LANDING
Take-off Fuel + | Trip Fuel +
ALLOWED WEIGHT FOR TAKE-OFF (lowest of a, b or c) a b c
Operating Weight -
ALLOWED TRAFFIC LOAD

Dest. | Dest. | Dest. | Dest. | Dest. | Dest. | TOTAL
POS. 1/ 2/ 3/ 4/ 5/ 6/ 7/ 8/ 9/
HOLD 1 2 3 4
.TW < ≡

SI POS.
Allowed Traffic Load
TOTAL TRAFFIC LOAD -
UNDERLOAD BEFORE LMC < ≡ =

TOTAL TRAFFIC LOAD
Dry Operating Weight +
ZERO FUEL WEIGHT LMC Max. ± =
Take-Off Fuel +
TAKE-OFF WEIGHT LMC Max. ± =
Trip Fuel −
LANDING WEIGHT LMC Max. ± =

LMC < ≡ LAST MINUTE CHANGES
Dest. Specifications Compt./Pal./Pos./ Plus Minus Weight
LMC Total +/−
Check LMC Total with Underload

Notes
Balance Cond.
Prepared by:
Approved by:

Trim Sheet

CONSTANTA

Trimsheet B 737 - 300
UR – UAA

Date: ____________ Prepared by: ____________

Flight: ____________ Approved by: ____________

All weights in KGS

MTW	61461 kg
MTOW	61234 kg
MLW	51709 kg
MZFW	48307 kg

BAY/ SECTION ULD LOAD — FOR 88"x108" AND 88"x125" ULD

P1

Weight	Index
1-48	0
49-145	-1
146-242	-2
243-339	-3
340-436	-4
437-533	-5
534-629	-6
630-726	-7
727-823	-8
824-920	-9
921-1017	-10
1018-1114	-11
1115-1211	-12
1212-1308	-13
1309-1405	-14
1406-1502	-15
1503-1599	-16
1600-1696	-17
1697-1792	-18
1793-1889	-19
1890-1986	-20
1987-2083	-21
2084-2180	-22
2181-2277	-23
2278-2374	-24
2375-2471	-25
2472-2568	-26
2569-2585	-27

P2

Weight	Index
1-68	0
69-204	-1
205-340	-2
341-476	-3
477-612	-4
613-748	-5
749-884	-6
885-1020	-7
1021-1156	-8
1157-1292	-9
1293-1428	-10
1429-1564	-11
1565-1700	-12
1701-1836	-13
1837-1972	-14
1973-2108	-15
2109-2244	-16
2245-2380	-17
2381-2516	-18
2517-2585	-19

P3

Weight	Index
1-114	0
115-342	-1
343-570	-2
571-798	-3
799-1026	-4
1027-1254	-5
1255-1482	-6
1483-1710	-7
1711-1938	-8
1939-2166	-9
2167-2394	-10
2395-2585	-11

P4

Weight	Index
1-352	0
353-1057	-1
1058-1762	-2
1763-2467	-3
2468-3172	-4
3173-3877	-5
3878-4172	-6

P5

Weight	Index
1-322	0
323-968	1
969-1614	2
1615-2260	3
2261-2906	4
2907-3552	5
3553-4172	6

P6

Weight	Index
1-110	0
111-332	1
333-553	2
554-775	3
776-996	4
997-1218	5
1219-1439	6
1440-1661	7
1662-1882	8
1883-2104	9
2105-2267	10

P7

Weight	Index
1-66	0
67-200	1
201-334	2
335-467	3
468-601	4
602-735	5
736-868	6
869-1002	7
1003-1136	8
1137-1269	9
1270-1403	10
1404-1537	11
1538-1670	12
1671-1804	13
1805-1938	14
1939-2071	15
2072-2205	16
2206-2267	17

P8

Weight	Index
48-143	1
144-239	2
240-334	3
335-430	4
431-526	5
527-622	6
623-717	7
718-813	8
814-909	9
910-1004	10
1005-1100	11
1101-1196	12
1197-1292	13
1293-1387	14
1388-1483	15
1484-1579	16
1580-1674	17
1675-1770	18
1771-1866	19
1867-1962	20
1963-2057	21
2058-2153	22
2154-2249	23
2250-2267	24

P9

Weight	Index
1-37	0
38-111	1
112-186	2
187-260	3
261-335	4
336-409	5
410-484	6
485-559	7
560-633	8
634-708	9
709-782	10
783-857	11
858-931	12
932-1006	13
1007-1080	14
1081-1155	15
1156-1229	16
1230-1304	17
1305-1379	18
1380-1453	19
1454-1528	20
1529-1587	21

NOTE: Maximum Total load P1 - P9 = 20412 KG

Cargo Hold (FWD and AFT)

CPT 1

Weight	Index
1-50	0
51-149	-1
150-248	-2
249-347	-3
348-446	-4
447-546	-5
547-645	-6
646-744	-7
745-843	-8
844-943	-9
944-1042	-10
1043-1141	-11
1142-1151	-12

CPT 2

Weight	Index
1-78	0
79-235	-1
236-392	-2
393-549	-3
550-706	-4
707-863	-5
864-1020	-6
1021-1118	-7

CPT 3

Weight	Index
1-92	0
93-276	1
277-460	2
461-644	3
645-828	4
829-1012	5
1013-1196	6
1197-1380	7
1381-1564	8
1565-1748	9
1749-1932	10
1933-2116	11
2117-2300	12
2301-2337	13

CPT 4

Weight	Index
1-47	0
48-141	1
142-234	2
235-328	3
329-422	4
423-516	5
517-609	6
610-703	7
704-797	8
798-891	9
892-984	10
985-1078	11
1079-1132	12

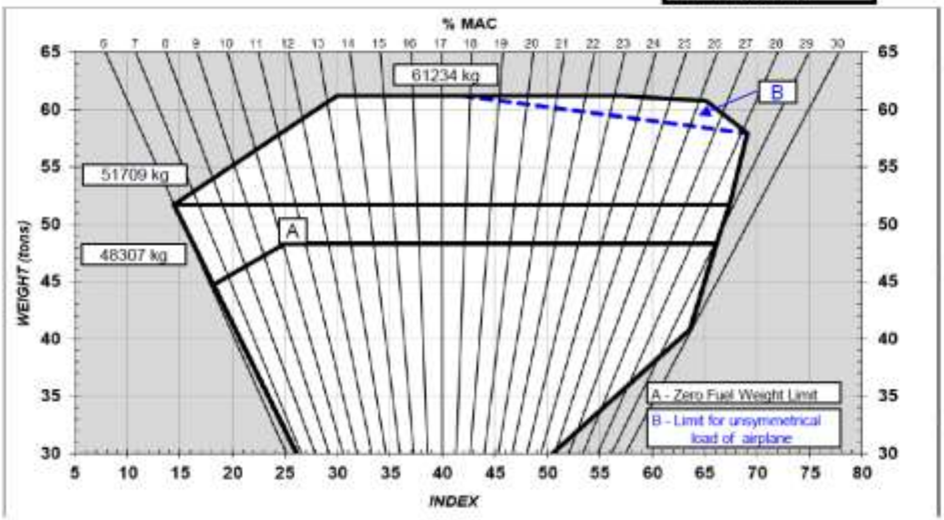
Fuel Index Table

Weight	Index
0-361	+0
362-1299	-1
1300-2608	-2
2609-4814	-3
4815-7096	-4
7097-7796	-3
7797-8303	-2
8304-8711	-1
8712-9058	+0
9059-9112*	+1
9113-9218	+1
9219-9851	+0
9852-10497	-1
10498-11146	-2
11147-11797	-3
11798-12449	-4
12450-13100	-5
13101-13747	-6
13748-14405	-7
14406-15046	-8
15047-15611	-9
15612-16095	-10
16096-16143**	-11

* Main Tanks are Full
** All Tanks are Full

Index Calculation Table

	(-)	(+)
DOI		
COMP1		
COMP2		
COMP3		
COMP4		
P1		
P2		
P3		
P4		
P5		
P6		
P7		
P8		
P9		
TOTAL		
	(-)	
LI ZFW		
T/O Fuel + / -		
LI TOW =		
LI ZFW		
LMC + / -		
Corrected LIZFW		
T/O Fuel + / -		
Corrected LITOW		
LI ZFW		
Lnd. Fuel + / -		
LI LAW =		



C.G. % MAC	Flaps 5 stab trim	Flaps 15 stab trim
6	6 1/4	5 3/4
10	5 3/4	5
14	5 1/4	4 1/2
18	4 3/4	3 3/4
22	4 1/4	3
26	3 3/4	2 1/2
30	3	1 3/4

Crew		DOW	DOI
2	0	31268	13,3
2	1	31343	12,2
2	2	31418	11,2
3	0	31353	12,0
3	1	31428	10,9
3	2	31503	9,9

TAKEOFF STAB TRIM SETTING:

Loading Instructions Report / LIR

CONSTANTA	LOADING INSTRUCTION REPORT / LIR B737-300 **UR-UAA**	
FLIGHT NUMBER	REG NUMBER	Date
STATION	FINAL DESTINATION	
Name Loadplanner: ______________		
Telephone: ______________		
SPECIAL INSTRUCTIONS		

ULD TYPE	BASE PLATE	MAX HEIGHT
Type A (PAG/PAJ)	88 x 125 in	60 in
PKC (Pos 9 only)	60,4 x 61,5 in	60 in

C - CARGO
E - EQUIPMENT
M - MAIL
N - NO ULD AT POSITION
U - UNSERVICEABLE
X - EMPTY ULD

ARRIVAL

Main Deck	P1 (2585 kg)	P2 (2585 kg)	P3 (2585kg)	P4 (4172 kg)	P5 (4172 kg)	P6 (2267 kg)	P7 (2267 kg)	P8 (2267kg)	P9 (1587kg)
Lower Deck	1 FWD (1151 kg)	2 FWD (1118 kg)				3 AFT (2337 kg)		4 AFT (414 kg)	5 AFT (718 kg)

ONLOAD INSTRUCTIONS

Main Deck	P1 (2585 kg)	P2 (2585 kg)	P3 (2585kg)	P4 (4172 kg)	P5 (4172 kg)	P6 (2267 kg)	P7 (2267 kg)	P8 (2267kg)	P9 (1587kg)
Lower Deck	1 FWD (1151 kg)	2 FWD (1118 kg)				3 AFT (2337 kg)		4 AFT (414 kg)	5 AFT (718 kg)

REPORT

Main Deck	P1 (2585 kg)	P2 (2585 kg)	P3 (2585kg)	P4 (4172 kg)	P5 (4172 kg)	P6 (2267 kg)	P7 (2267 kg)	P8 (2267kg)	P9 (1587kg)
Lower Deck	1 FWD (1151 kg)	2 FWD (1118 kg)				3 AFT (2337 kg)		4 AFT (414 kg)	5 AFT (718 kg)

The aircraft has been loaded in accordance with these instructions, including the deviations recorder. The load has been secured in accordance with company regulations.	Name and signature of loading supervisor or person responsible for loading:

6.4.3. Last Minute Change

All changes in traffic load and fuel (regardless of +/-) occurring after completion of the Load Sheet, shall be brought to the attention of the Commander and be recorded on the Load Sheet.

Before recording a LMC, the person preparing the Load Sheet ensure that:

1. The total mass of the LMC does not exceed the calculated under load or any mass limitation of the aircraft;
2. The load limitations of compartments and positions are not exceeded;
3. The center of gravity stays within the allowed limits.

The following shall be recorded on the Load Sheet:

1. Kind of LMC;
2. Actual ZFM, TOM and LM;
3. Actual centre of gravity/STAB trim.

A new Load Sheet should be prepared, if the following LMC values are exceeded 500 kg.

6.5. Limiting Masses and Center of Gravity

During any phase of operation, the loading, mass and center of gravity of the aircraft must comply with the limitations specified in the approved AFM, or the Operations Manual if more restrictive.

Reference: Please refer to chapter 1.1.5 OM Part B.

6.5.1. Maximum Gross Masses

CERTIFIED WEIGHT LIMITS - MTW 135500 LB (61461 KG)

The Maximum Certified Gross Weights and Center of Gravity Limits are shown graphically on pages 2 & 3. These Center of Gravity Limits are for taxi, takeoff, flight and landing unless otherwise specified, and are the absolute limits which must not be exceeded by the airplane center of gravity in any taxi, takeoff, flight, or landing configuration.

CERTIFIED GROSS WEIGHTS			
		LB	KG
Maximum Taxi Weight	(MTW)	135500	61461
Maximum Takeoff Weight	(MTOW)	135000	61234
Maximum Landing Weight	(MLW)	114000	51709
Maximum Zero Fuel Weight	(MZFW)	106500	48307
Minimum Flight Weight	(MFW)	63400	28757

6.5.2. Crew Masses

Crew Position	Standard Weight Male & Female
Flight Crew	85 kg

Note: Any additional baggage must be taken into account.

Supernumerary Crew Members shall be considered as crew for mass and balance purposes.

6.5.3. Mass Values for Passengers

N/A.

6.5.4. Mass Values for Checked Baggage

N/A.

6.5.5. Aircraft Loading

It is the responsibility of Aircompany to ensure that:

1. the loading of its aircrafts is performed under the supervision of qualified personnel.
2. the loading of the freight is consistent with the data used for the calculation of the aircraft mass and balance.
3. structural limits such as the floor strength limitations, the maximum load per running metre, the maximum mass per cargo compartment, and/or the maximum seating limits are comply with aircraft structural limits.
4. applied to the certificated centre of gravity envelope. Free seating is not applicable.

Note: in case of extreme variation in CG travel during flight caused by crew movement and fuel consumption/transfer.

6.6. Load Information Codes

Please refer to GOM/LMM.

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7. PROCEDURE FOR LOADING & SECURING THE LOAD

Procedures and provisions for loading, unloading and securing the load in the aircraft.

Refer to AFM (Aircraft Flight Manual), Section 1/ Aircraft Weight and Balance Manual, Section “Cargo”

7.1. Objective

Intro:

Aircompany ensures that the contents of the Loading are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.

The main objectives of load control are the following:

- Prevent that any of the aircraft’s operational or structural limitations are exceeded
- Ensure that the center of gravity of the aircraft is within limits
- Ascertain that the load on board is distributed and secured in accordance with relevant instructions
- Ensure that the load and its distribution onboard is correctly recorded on the documents involved
- Ensure that all baggage and cargo on board, which might cause injury or damage, or obstruct aisles and exits if displaced, is placed in stowage designed to prevent movement.
- Ensure that dangerous goods are loaded, segregated, stowed and secured on an airplane in cargo compartments as specified in the ICAO Technical Instructions (ICAO-Doc 9284-AN/905) and/or IATA DGR.

CAUTION: The commander shall not commence a flight unless he/she is satisfied that the load is properly distributed and safely secured.

Priority of Load Control

The purpose of the weight and balance computation is to meet the objectives above. Computations made on the form reflect the amount and physical placement of load on the aircraft. These computations must result in locating the total weight and center of gravity within certified weight and C.G envelope. This ensures that the aircraft can be maneuvered safely both on ground and in flight.

The load amount and load placements directly affect the safety of the flight during take-off, cruise and landing. As a result, no other aspect of the many prior-to-flight operations functions is as critical as the weight and balance computation.

Note: Dangerous Goods shall not be carried on the flight deck, except as specified in the ICAO Technical Instructions (ICAO-Doc 9284-AN/905) and/or IATA DGR.

For additional information refer to: GOM.

7.2. Loading

7.2.1. General

Aircraft loading is probably the most important ground function for which the flight deck crew has the overall responsibility and supervision that the correct loading is performed according to Boeing 737 loading instruction.

Handling Department is responsible:

- Proper loading is important for several different reasons, of which the first and foremost is flight safety.
- The goods must be properly secured to prevent shifting while the aircraft is in flight.
- The cargo must be inspected and properly distributed to avoid concentrated weight loads that may damage the aircraft floor structure. It is also important that the aircraft is not damaged by ground equipment while the loading is taking place.
- Goods should be segregated in a manner that will allow for expeditious handling at enroute and destination stations.
- Dangerous Goods must be load in accordance with IATA Dangerous Goods Regulations.
- **Note:** Dangerous Goods are loaded, segregated, stowed and secured on an airplane in cargo compartments as specified in the ICAO Technical Instructions (ICAO-Doc 9284-AN/905) and/or IATA DGR. The commander shall not commence a flight unless he/she is ensured that packages of dangerous goods bearing the "Cargo Aircraft Only" label are not loaded on the aircraft.

7.2.2. Loading and Unloading

A careful planning of all activities must be made.

- All goods must be inspected for leakage or otherwise damaged shipments.
- All goods must be labeled clearly indicating point of unloading.
- Mail should not be mixed with cargo.

7.3. Definitions

- Dry operating mass (DOM)

  The total mass of the aeroplane ready for a specific type of operation excluding all usable fuel and traffic load. This mass includes items such as:

- Crew and crew baggage
- Catering
- Potable water and lavatory chemicals

- Mass and Balance Documentation

  The Mass and Balance Documentation in the OM-A 8.1.8. is defined as loadsheet (LS).

- Maximum zero fuel mass (MZFM)

  The maximum permissible mass of an aeroplane with no usable fuel. The mass of the fuel contained in particular tanks must be included in the ZFM when it is explicitly mentioned in the AFM limitations.

- Maximum structural landing mass (MLM)

  The maximum permissible total aeroplane mass upon landing under normal circumstances.

- Maximum structural take-off mass (MTOM)

  The maximum permissible total aeroplane mass at the start of the take-off run.

- Traffic load

  The total mass of baggage and cargo, including any non-revenue load.

- Payload (PL)

  The total mass of revenue load (pax, cargo or mail).

- Last minute change (LMC)

  A change after the completion of the loadsheet which does not require the preparation of a new loadsheet if the changes to the existing loadsheet do not exceed the limits specified in this chapter.

7.4. Maximum Gross Masses

Reference: Please refer to chapter OM Part B sec. 6.5.1

7.5. Cargo Compartment

7.5.1. Limitations

Refer to: AFM, W&B and Load Master Manual.

Unit of Measure Conversion:

- 1 kg/m ≈ 0.0254 kg/in
- 1 kg/in ≈ 39.37 kg/m

The following items must be secured:

- Items with an individual weight between 50kg and 149kg, if the compartment is not volumetrically full.
- All DG and Special Load
- Items with an individual weight of less than 50kg, but having a density of more than 240kg/m3 (high density load, e.g., pieces of machinery, metal bars). Lashing is not required if the compartment or net section is volumetrically full and remains full up to the point of unloading of these items.

Note: A compartment or net section is considered volumetrically full if it is filled up to at least 80% of its capacity.

7.5.2. Door Open Dimensions

7.5.2.1. Door Dimensions for all Boeing 737

Forward Compartment Door

Refer to: AFM, W&B and GOM.

Aft Compartment Door

Refer to: AFM, W&B and GOM.

7.5.3. Cargo Doors Operation

Refer to: AFM, W&B and GOM.

7.6. Loading Instruction / Report Form

Please refer to GOM..

7.7. Tail Tipping

Heavy loads in AFT Compartments and galley in combination with low fuel may cause the aircraft to be unstable. Therefore, FWD Compartment and galley shall always be loaded first and unloaded last.

In practice the tip-up CG position is considered to be dangerous for ground stability at B737 aircraft CG of 40 % MAC or higher. The absolute tipping limit is at 51% MAC, considerably aft of the ground stability limit. Some of the major factors affecting the tipping and stability limits will include, but are not limited to the following items:

- Airplane empty weight;
- Airplane attitude;
- Fuel loading;
- Cargo loading;
- Ramp slope;
- Snow loads.

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8. CONFIGURATION DEVIATION LIST

The Configuration Deviation List (CDL) is provided by the manufacturer CDL include the conditions and operating procedures to be followed when an aircraft is being dispatched under the items of its CDL.

The CDL is included in the Aircompany Constanta MEL/CDL that is a separate document and approved by SAAU.

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9. MINIMUM EQUIPMENT LIST

The Minimum Equipment List is included in the Aircompany Constanta MEL/CDL that is a separate document and approved by SAAU.

9.1. General

In principle, all equipment included in the type certificated configuration must be operative before dispatch of an aircraft. However, with the high degree of redundancy that is available in a modern aircraft, some deviation from the type certificated configuration may under certain conditions be accepted without sacrificing a safe operation. A Minimum Equipment List (MEL) specified the equipment, systems and components which must be operative in order that the aircraft may be considered airworthy for dispatch. The MEL reflects the Company’s policy for safe and efficient operation. It is based on SAAU requirement and the Master Minimum Equipment List (MMEL) approved by respective authorities. The MEL may be more conservative than the authority requirements and/or the MMEL, but must never the less restrictive.

Company shall not operate an airplane other than in accordance with the MEL unless permitted by the Authority. Any such permission will in no circumstances permit operation outside the constraints of the MMEL.

9.2. Purpose of MEL

The purpose of the MEL is to provide a dispatch aid for flight crews and maintenance crews in their efforts to bring an aircraft from its point of origin to its point of destination safely and on time when repair of a deficiency is not possible without considerable impact on the flight schedule. The MEL specifies the equipment, components and systems which must be operative or which may be totally or partially inoperative, while airworthiness, flight safety and comfort is still maintained. It also specifies ultimate time limits for rectification of inoperative equipment or systems. It is not the intention that specified time limits in the MEL should be utilized to the extreme. All efforts shall be made to rectify inoperative items as soon as possible in order to minimize the time, during which an aircraft is operated with reduced system redundancy. The MEL should be used as a means to bring an aircraft to a station where repair can be made without interrupting or delaying an ongoing flight.

9.3. Use of the MEL

MEL governs the dispatchability of the aircraft until flight is commenced (application of takeoff thrust on runway). Dispatch of an aircraft with reference to MEL requires acceptance from the Commander it should be emphasized that the Commander, based on present or expected conditions, has the authority to require repair even if dispatch is allowed according to MEL. As a general rule the MEL should be referred to only when it has been concluded that repair or replacement of a malfunctioning system or component cannot be made without causing an unacceptable delay. Whenever an aircraft is dispatched with a reference to MEL, the fault must be positively identified and if applicable, isolated. It must be ascertained that possible effects and interaction with other systems are known and understood. Dispatch of an aircraft with more than one uncorrected MEL remark is permitted only if completely separate systems are involved, emergency procedures related to one of the MEL remarks do not affect emergency procedure for the other MEL remark or vice versa and pilot workload is not significantly increased. When an aircraft is dispatched on MEL-requirements a reference to the MEL item and the repair category must be entered in the Aircraft Technical Log.

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10. SURVIVAL AND EMERGENCY EQUIPMENT

Intro:

Aircompany ensures that the contents of the Survival and Emergency Equipment are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.

10.1. List of Survival Equipment and Procedure for Checking the Serviceability

Aircompany shall ensure that there are available for immediate communication to rescue coordination centers, lists containing information on the emergency and survival equipment carried on board all airplanes and at the OCC.

Descriptions and details of the location, checking, use and operation of each item of safety equipment carried on board Aircompany aircraft which crew members may be required to operate can be found in:

- Respective FCOM

All Emergency Equipment has to be checked before each flight whether it is a round trip or a stopover flight.

Emergency Equipment such as First Aid kit, Flashlight, ELT and Megaphone shall be taken along by the respective crew member who is responsible for these emergency items in case of an emergency.

Aircompany shall not operate an airplane unless:

1. It is equipped with first-aid kits, readily accessible for use.
2. Hand fire extinguishers are provided for use in crew and, as applicable, cargo compartments and galleys.
3. Crash axes and crowbars.
4. Emergency lightning is serviceable.

CAUTION: Crew shall ensure that before taxiing, take-off and landing, and when safe and practicable to do, so, an assisting means for emergency evacuation that deploys automatically, is armed.

10.1.1. Fire Fighting Equipment

10.1.1.1. Fire Extinguishers

Water and Halon fire extinguishers are located throughout the cargo cabin and flight deck.

Fire Extinguisher Usage

Each class of fire calls for specialized action. Using the wrong extinguisher may do more harm than good. For your own protection, you should know these basic types, how to use them, and why.

CLASS OF FIRES There are three common classes of fire:		EXTINGUISHER TYPE
CLASS A	COMBUSTIBLE MATERIALS paper, wood, fabric, rubber, certain plastics, etc., where quenching by water is effective.	**TYPE A** Water (H_2O) saturates material and rekindling prevents
CLASS B	FLAMMABLE LIQUIDS gasoline, oils, greases, solvents, paints, burning liquids, cooking fats, etc., where smothering action is required.	**TYPE B** BCF (Halon 1211)
CLASS C	LIVE ELECTRICAL fires started by short circuit or faulty wiring in electrical, electronic equipment or fires in motors, switches, galley equipment, etc., where a nonconducting extinguisher agent is required. **Note:** Whenever possible, electrical equipment should be de-energized before attacking a class C fire.	**TYPE C** BCF (Halon 1211)

WARNING:

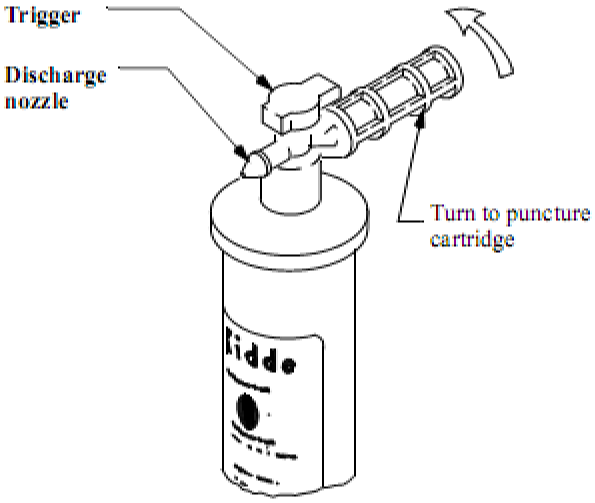
1. The wrong extinguisher on a fire could do more harm than good.
2. The concentrated agent, or the by-products created by the heat of the fire, are toxic when inhaled.

10.1.1.1.1. Water Fire Extinguishers

Water fire extinguishers contain a solution of water mixed with antifreeze. Water fire extinguishers are to be used on fabric or paper fires only. They are not to be used on electrical or grease fires.

To use the water fire extinguisher, remove it from stowage and rotate the handle fully clockwise. Aim the nozzle at the base of the fire and press the trigger.

CAUTION: Antifreeze compound has been added to the water which makes it unfit for drinking. Do not use on electrical or grease type fires.



Operation:

To use the water fire extinguisher:

- turn handle clockwise as far as possible (charges bottle with CO_2)
- hold bottle upright
- direct at base of flame
- press trigger to discharge
- sweep in a side-to-side motion
- To recharge in flight:
- unscrew top (CO_2 charge bleeds off)
- refill with water
- replace top
- unscrew handle
- replace CO_2 cylinder
- reinstall handle; the extinguisher is now ready to use.

10.1.1.1.2. ***Halon Fire Extinguishers***

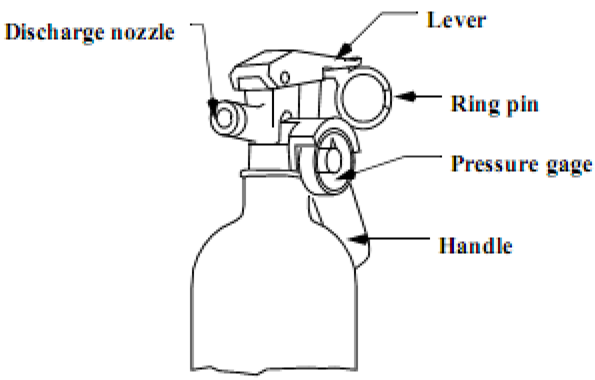
Halon fire extinguishers contain a liquefied gas agent under pressure. The extinguisher pressure indicator shows three pressure ranges:

- acceptable
- recharge
- overcharged.

A safety pin with a pull ring prevents accidental trigger movement. When released, the liquefied gas agent vaporizes and extinguishes the fire. The extinguisher is effective on all types of fires, but is used primarily on electrical, fuel, and grease fires

WARNING: If a fire extinguisher is to be discharged in the flight deck area, all flight crew members must wear oxygen masks and use 100% oxygen with emergency mode selected.

CAUTION: For electrical fires, remove the power source as soon as possible. Avoid discharging directly on persons due to possibility of suffocating effects. Do not discharge too close to fire as the discharge stream may scatter the fire. As with any fire, keep away from the fuel source. Avoid breathing vapors, fumes and heated smoke as much as possible.



To use the Halon fire extinguisher:

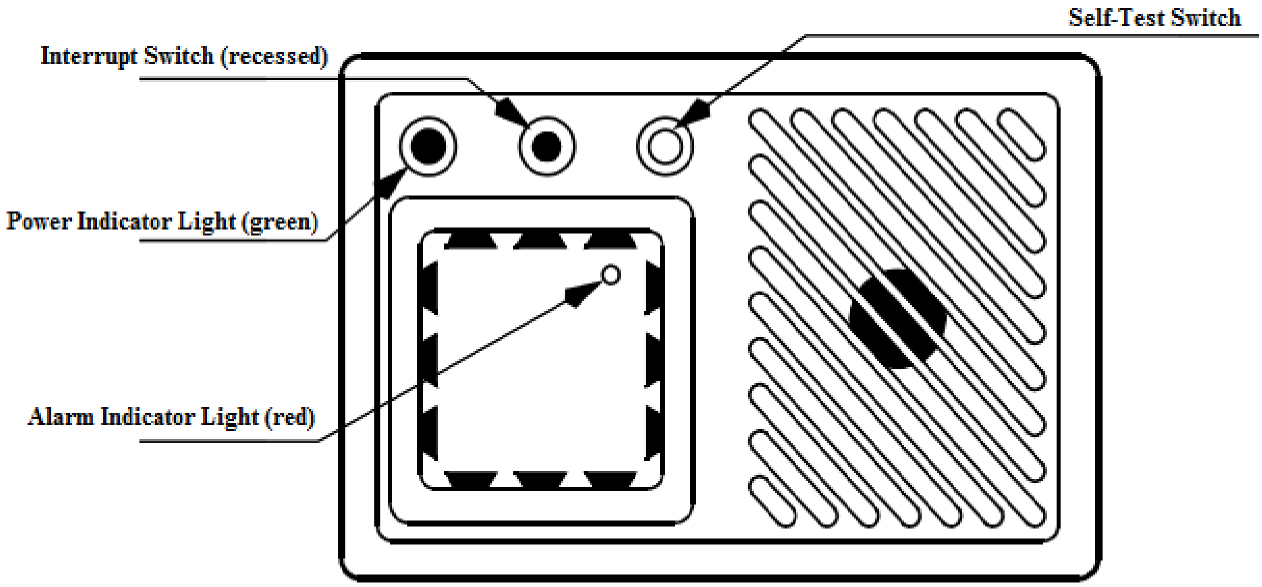
- pull ring pin from lever and handle
- hold extinguisher upright with hand under handle and thumb on top of lever
- from a distance of 6-10 feet, direct the nozzle toward the base of the fire source
- squeeze the lever downward with thumb
- spray at the base of the flame in quick side-to-side motion.

Note: The extinguisher stream will shoot over at 10-foot distance.

10.1.1.1.3. ***Smoke Detector and Lavatory Fire Extinguishing System***

A smoke detector is mounted in each lavatory ceiling. When activated, a horn sounds in the smoke detector and the red Alarm Indicator Light illuminates on the smoke detector.

Once the smoke clears, the red Alarm Indicator Light extinguishes, the horn stops, and the smoke detector is sensitive to smoke again.

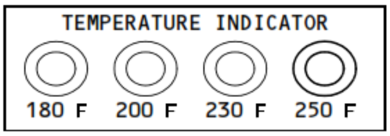


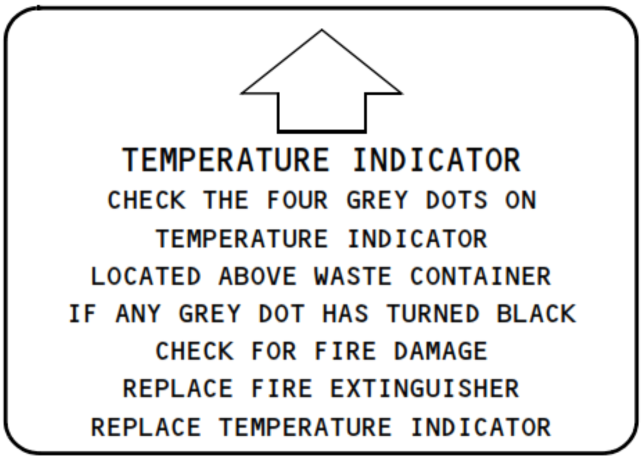
10.1.1.1.4. ***Lavatory Fire Extinguishing System***

An automatic fire extinguishing system is located beneath the sink in each lavatory. A fire extinguisher discharges a non-toxic Freon gas through either one or both heat-activated nozzles.

Temperature Indicator

A temperature indicator is located inside the waste compartment below each sink. Grey dots on the indicator turn black when exposed to high temperatures (82-121°C / 180-250°F). If any dot has turned black, the extinguisher needs to be replaced.



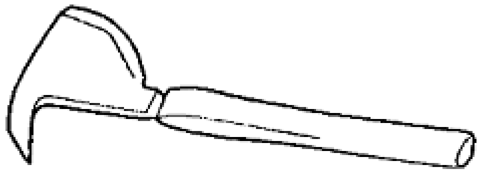


10.1.1.2. **Fire Axe**

The fire axe is located on board. It is a similar shape to a normal axe, with the addition of a hook.

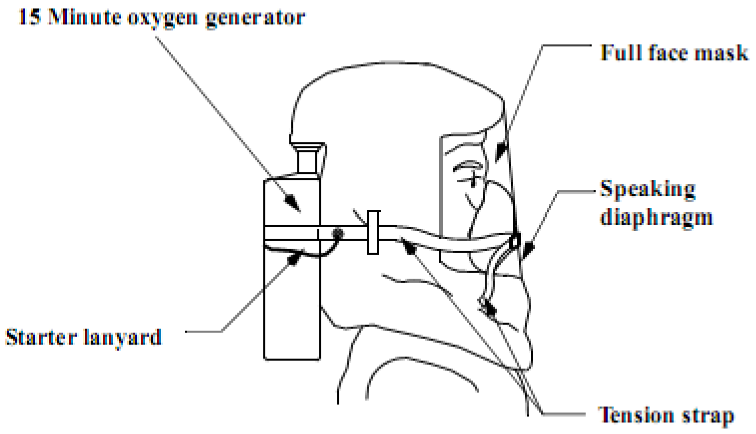
It is made of steel and has a rubber sleeve fitted over the handle. This is to prevent the user from receiving an electric shock if used for removing live electrical cabling.

The axe may also be used for levering or punching a hole in the sidewalls in order to fight a sidewall fire. It cannot be used for opening an inoperable exit or attempting to break through the aircraft hull.



10.1.1.3. **Protective Breathing Equipment (PBE)**

Smoke hoods are installed in the cargo cabin near the stations. The smoke hoods provide an oxygen supply and smoke protection, and are to be used when fighting a fire. The smoke hood is placed over the head and, when activated, provides approximately 15 minutes of oxygen.



Operation:

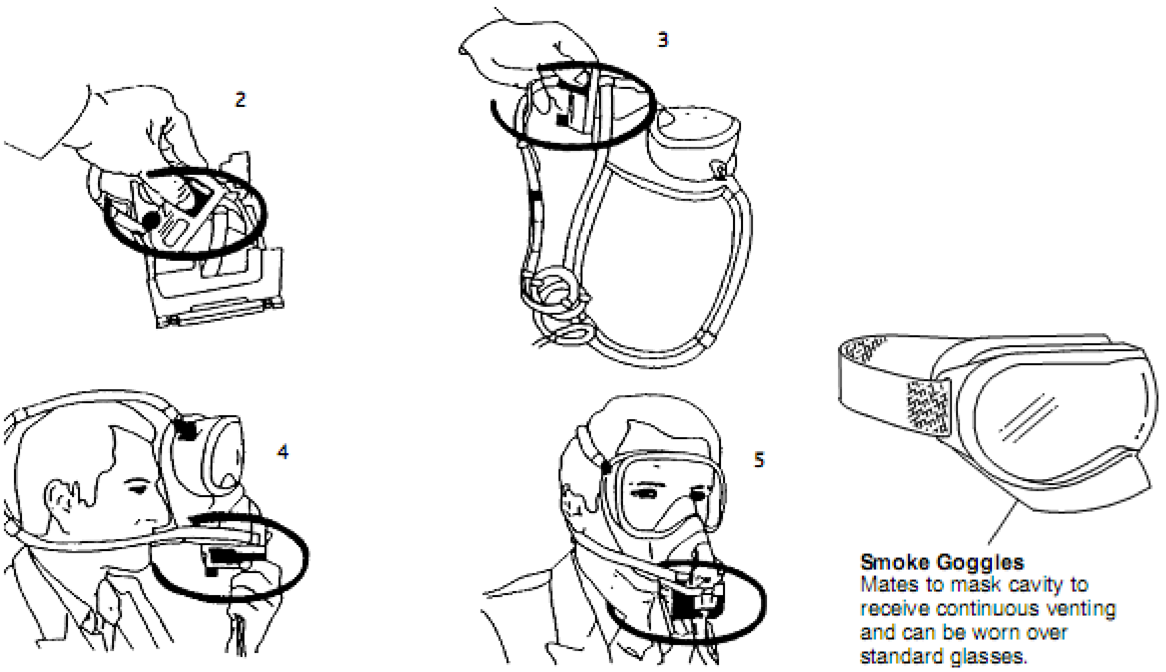
Detailed operating instructions are placarded on the container.

10.1.1.4. **Flight Deck Oxygen Masks (QDM)**

The flight deck oxygen system is completely separate from the cabin oxygen system. An oxygen cylinder is located in the lower fuselage. This cylinder supplies quick-donning oxygen masks which are stowed in readily accessible boxes adjacent to each flight deck seat. One mask is provided for each seat in the flight deck, and encompasses goggles and an "oro-nasal" oxygen mask. It provides protection against toxic fumes, smoke or in the case of flight deck window failure.

Operation:

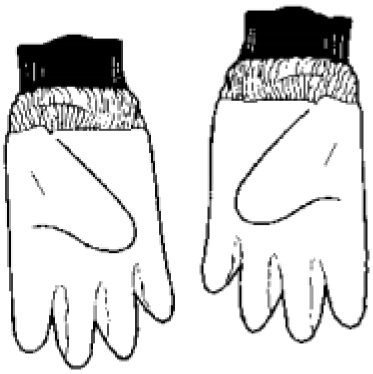
1. Lift the lid of the box.
2. Squeeze the "red clips" on the mask box. This action unlocks the two-flap door.
3. Pull the mask out – the harness inflates.
4. Pull mask over face and release red clips.
5. The harness deflates and maintains mask in position.



10.1.1.5. **Fire Gloves**

Fire Gloves are intended to be used for fire-fighting procedures.

They are made of fire/heat resistant material to provide the wearer with protection for the hand and wrist area.



Operation:

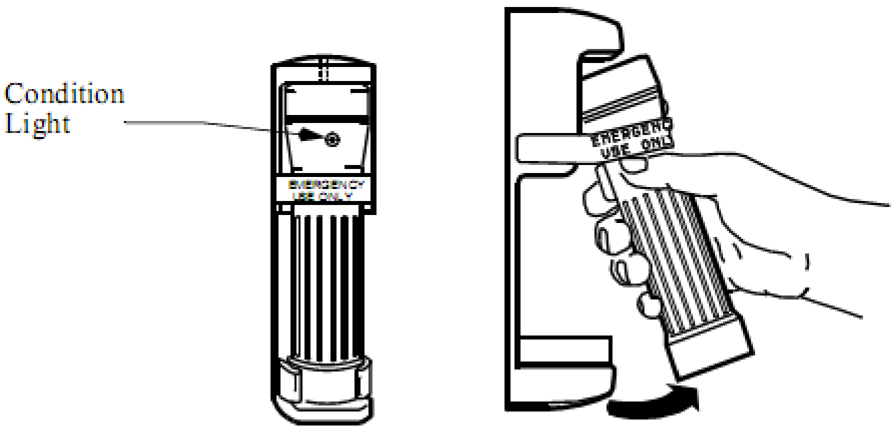
To be worn as gloves, ensuring wrists are covered.

10.1.2. Evacuation and Survival Equipment

10.1.2.1. **Flashlights**

All Aircompany`s aircraft is equipped with an Emergency Flashlight, which is located at each required CC station.

The flashlight is battery operated, secured in its own mounting bracket. Each flashlight has a Perspex shield to prevent misuse as they are for emergency purposes only. The flashlight battery should maintain a sufficient reserve of power to operate the flashlight for up to six hours. The condition of the battery is indicated by a flashing red light on the flashlight. Ideally this should flash every 3 to 4 seconds. When the flash rate reaches 10 seconds or more, the battery needs changing.



Flashlight in Bracket   Removal from Bracket

Operation:

1. Remove from bracket
2. Flashlight will illuminate automatically
3. Flashlight has a minimum duration of 30 minutes and a maximum of 4 hours.

10.1.2.2. **Medical Equipment**

10.1.2.2.1. ***First Aid Kit***

First Aid Kits are carried on all flights and are distributed as practicable in the cabin to be readily accessible for use by crew members. There are 2 kits on board of Boeing 737 aircrafts.

Note: the flight shall not be commenced unless aircraft is equipped with first-aid kits, readily accessible for use.

10.1.2.2.2. ***Doctor's (Medical) Kit***

The flight shall not be commenced unless aircraft is equipped with a Doctor's Kit if any point on the planned route is more than 60 minutes flying time (at normal cruising speed) from an aerodrome at which qualified medical assistance could be expected to be available. Doctor's Kit is dedicated for use by medical doctors or individuals with appropriate qualifications or training.

10.1.2.2.3. ***CDC First Aid Kit***

N/A

10.1.2.3. **Survival Equipment**

Not applicable.

10.1.2.4. **Pyrotechnics**

Reference: Please refer to AFM.

10.1.2.5. **Emergency Locator Transmitter - ELT**

All Aircompany`s aircrafts are equipped with ELT in accordance with ICAO Annex 10 Vol. III. which simultaneously operates on 121.5 MHz and 406 MHz frequencies.

Note: ELT is included in the Minimum Equipment List.

Operation:

ELT is automatically activated during an aircraft crash or manually from the flight deck.

10.1.2.6. **Megaphones**

N/A

10.1.3. Flotation Equipment

The flight shall not be commenced unless there is sufficient equipment on board.

Note: Flotation equipment is included in the Minimum Equipment List.

10.1.3.1. **Infant Life Vest**

N/A

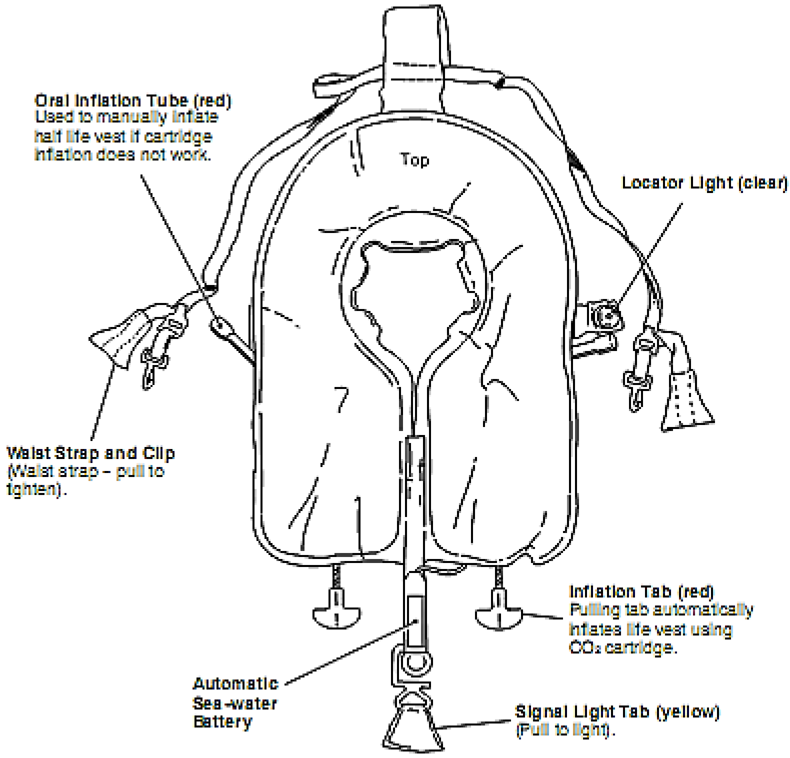
10.1.3.2. **Adult Life Vest**

Stowed in its own valise, the life jacket is usually colored yellow/orange. It is made of a rubberized nylon material. Life jackets are provided for every crew member (red).

The jacket consists of a double chamber, held in place by 2 tapes passed around the waist. It is equipped with a CO2 cylinder and a toggle for primary inflation. A secondary means of inflation is provided by an oral tube. This tube can also be used if deflation is required.

A water activated battery is connected to a light which will give 12 hours illumination. There is also a whistle for attracting attention.

Note: Minimum 1 life vest is provided for each crewmember.



All the life jackets are equipped with a light and battery, whistle, inflation toggle and cylinder and manual inflation tube which are located down each side of the jacket. The actual location of these items may vary however there will be two items on each side of the life jacket.

Operation:

1. Remove the jacket from its valise.
2. Unfold and place jacket over the head, with inflation aids facing the front.
3. The tapes are passed around the waist and tied in a double knot underneath the jacket on the left hand side of the body.
4. Then leaving the aircraft, inflate the jacket by pulling the toggle sharply downwards. If the jacket fails to inflate, blow into the oral tube. If deflation is required, air can be released by inserting your little finger into the oral tube.
5. To enter the water, grasp the lower neck of the life jacket with both hands and pull down. Elbows should be over the top of the jacket to form a “V” shape. Adopting this position will prevent injuries to the neck.
6. Step into the water.

CAUTION: Inflate life vest just before leaving the aircraft! If using overwing emergency exit inflate life vest when on the wing.

Note: Seat cushions can be used as an additional flotation aid.

10.2. Oxygen (Fixed and Portable)

10.2.1. Fixed Oxygen Systems

Two independent oxygen systems are installed on all aircrafts:

- one for the flight deck.

Passenger and Cabin Attendant Emergency Oxygen

N/A. Aircompany operates only cargo flights.

10.2.1.1. **PSU Oxygen Mask Compartment**

N/A

10.2.1.2. **Flight Deck Oxygen System**

Reference: please refer to chapter OM Part B sec. 10.1.1.4.

10.2.2. Portable Oxygen

There are portable oxygen bottles stowed in various locations in the cargo cabin. The bottles are fitted with disposable masks and are used for first aid purposes or as walk-around units.

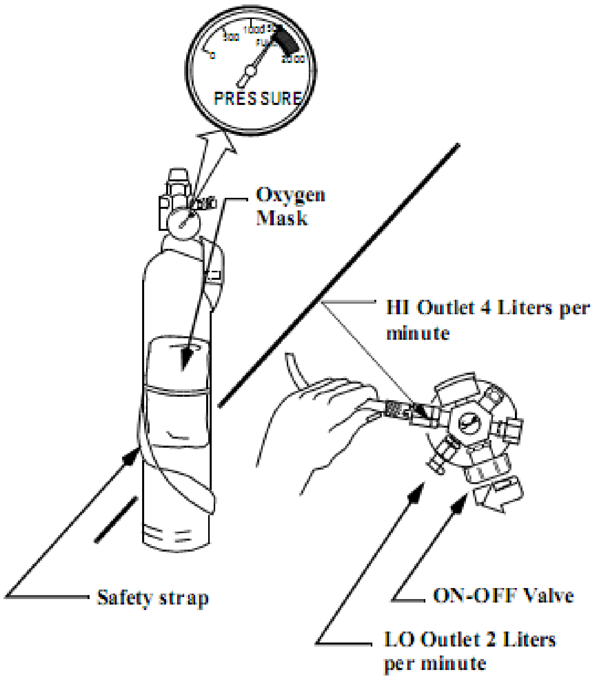
The contents gauge on each portable oxygen bottle indicates from 0 to 2,000 psi. When the gauge needle is in the range between 1,500 to 1800 psi this indicates that the bottle is fully charged.

Oxygen Bottle Description

This portable oxygen bottle consists of a lightweight cylinder containing either 310/120 litres of oxygen, and a carrying harness. It comes in three different sizes with two different capacities. On the cylinder is an on/off valve and a pressure gauge. The flow rate indicator is on the top of the cylinder and can be changed from 4 litres to 2 litres by turning the dial.

Oxygen Mask Description

This consists of a non-disposable yellow rubber oral-nasal mask. Each mask has a ventilating grill incorporated, a reservoir bag and a length of tubing with a bayonet fitting to attach it to an outlet on the bottle. There is also an elasticated band to keep the mask in position when in use.

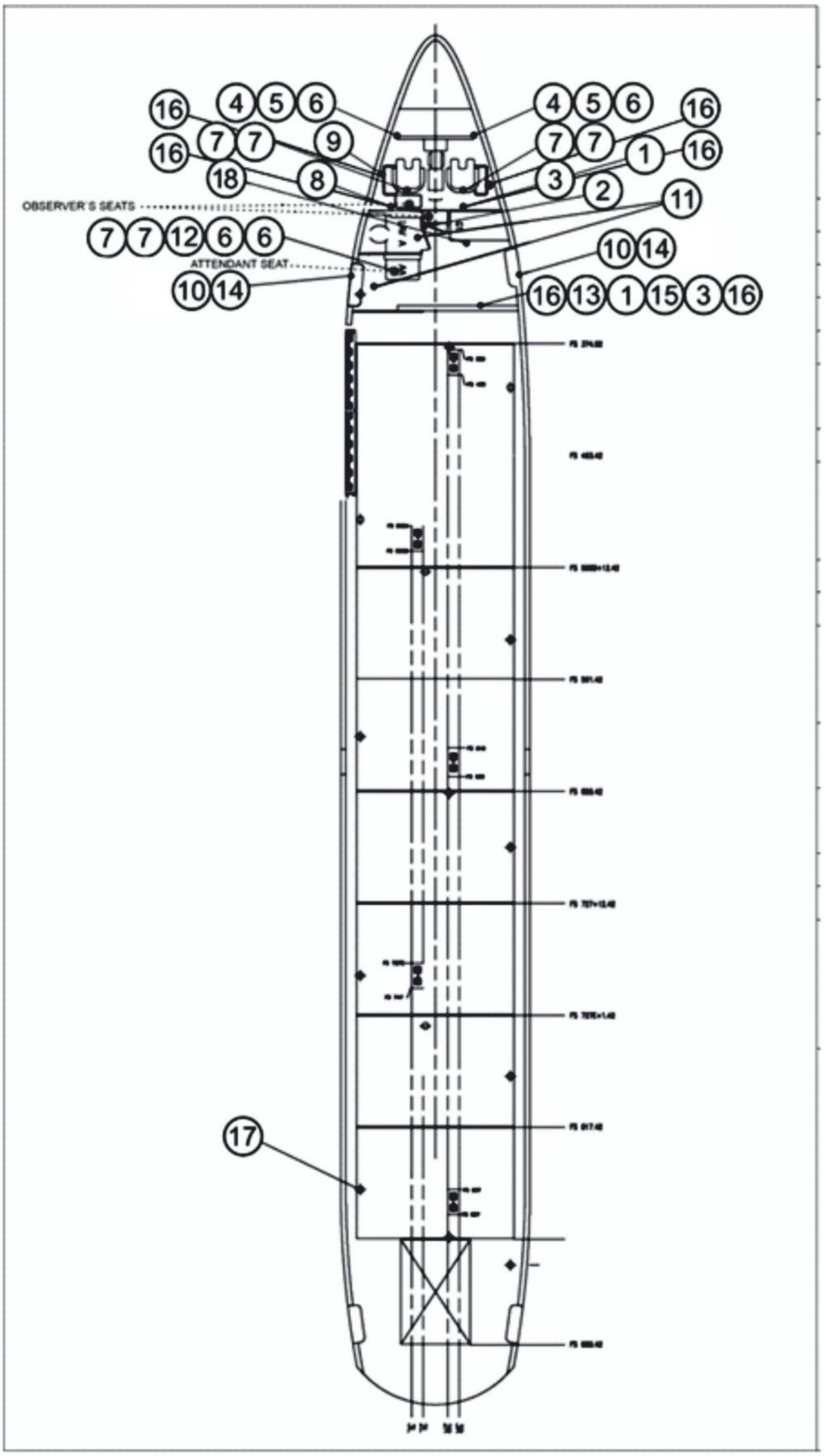


Operation:

1. Remove oxygen set from stowage.
2. Ensure mask attached to the flow outlet and that the dial is on 4 for HI flow.
3. Turn ON/OFF valve to the on position and check oxygen is flowing, this is achieved by grasping the neck of the reservoir bag. The bag will inflate if oxygen is flowing.
4. The reservoir bag is used to store oxygen ready for the next inhalation. The bag must be checked for tears and the tubing free of kinks.
5. Fit mask to the person using elasticated band to keep it in place.
6. A constant flow of oxygen will be delivered. However, the ventilating grill will allow air to be drawn in as well as oxygen during inhalation, giving an air/oxygen mix.
7. If person shows signs of recovery, the oxygen flow can be reduced to 2 (LO flow).
8. If possible, do not allow oxygen pressure to fall below ¼ full on the gauge.

WARNING: Take precautions to ensure that oxygen bottles do not come into contact with oil, grease, or other contaminants during handling. An explosion could result if this happens.

10.3. Emergency Equipment Layout



NO.	NAME	QTY
1	PBE	2
2	CRASH AXE	1
3	FIRE EXTINGUISHER	2
4	GOGGLE	2
5	ESCAPE ROPE	2
6	FLASHLIGHT	4
7	LIFE VEST	6
8	PORTABLE ELT	1
9	FIREPROOF GLOVES	1
10	ESCAPE SLIDE	2
11	ATTENDANT OXYGEN SYSTEM	1
12	TOOL KIT	1
13	FIRST AID KIT	1
14	DOOR BARRIER STRAP	2
15	PORTABLE O^2 BOTTLE	1
16	OXYGEN MASK	6
17	FIXED ELT	1*
18	DANGEROUS GOODS EMERGENCY KIT	1

* One fixed ELT is behind the celling at aft cabin, and no work in the everyday check.

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11. EMERGENCY EVACUATION PROCEDURES

Intro:

Aircompany ensures, that the contents of the Emergency Evacuation Procedures are presented in a form in which they can be used without difficulty. The design of the Operations Manual observes Human Factors principles.

Aircompany does not operate an airplane with a maximum certificated take-off mass exceeding 15.000 kg or having a maximum approved passenger seating configuration of more than 19 unless it is equipped with a crew member interphone system except for airplanes first issued with an individual certificate of airworthiness before 1 April 1965 and already registered in a Member State on 1 April 1995.

11.1. Crew Duties Specific Areas of Responsibilities

11.1.1. Flight Crew

Depending on the circumstances the commander will remain on board to monitor the situation internally and the co-pilot will evacuate to monitor the evacuation externally.

Note: For additional information please refer to QRH non-normal procedures and checklists.

11.1.2. Cabin Crew

N/A.

11.2. Emergency Drills

In the event of a planned emergency where time is available to brief the crewmembers and prepare the cabin for an emergency landing or ditching, the following drill should be carried out.

ALL AIRCRAFT EMERGENCY DRILL AND DEFINITION

A. Emergency Drill

(Ditching procedures are shown in italics)

1. Acknowledge.
2. Brief.
3. Demo PA (including life jackets & distribute infant flotation aids).
4. Explain relevant exits to ABPs.
5. Final “cabin secure” check.
6. Dim cabin lights.
7. Landing positions.
8. Brace.
9. Open/Operate exits and direct.
10. Evacuate.

B. Definition of Emergency Drill

11.3. Definition of Types of Emergencies

- Planned Emergency
- Unplanned Emergency
- Emergency Landing and Ditching
- Precautionary Landings
- De-plane

11.4. Crew Coordination

Refer to FCOM/QRH.

11.5. Notifications of Emergencies

Refer to FCOM/QRH.

11.5.1. Procedure Following an Incident

N/A

11.6. Initiation of Evacuation

Refer to FCOM/QRH.

11.7. Instructions for Evacuation

Refer to FCOM/QRH.

11.8. Unusable Exits

The basic principle of any emergency evacuation is to utilize all usable exits. When an exit is opened in the 'armed' configuration the slide should inflate, if it fails to inflate a manual inflation handle should be pulled. If the slide still fails to inflate or the assigned exit is unsafe instantly abandon and redirect to another exit.

Note: Expect some exits to be jammed, under water, blocked by fire or otherwise unusable.

Definitions of an Unusable Exit

- Blocked by fire or smoke.
- Blocked by terrain.
- Jammed in the closed position.
- Partially or totally underwater.
- Failure of a slide (to inflate).

11.9. Public Address Announcements

Cockpit crew shell accomplish Evacuation Checklist in QRH Non – Normal checklist. After aircraft has come to complete stop, it is accepted that only the Commander can order an evacuation. To do so he would announce commands using PA.

Note: However, circumstances as catastrophic and crash landing might dictate that any other member of the crew must initiate such action by announcing those commands. After the aircraft has stopped there may be no further communication, and the other crew will have to make the decision and use their own mature judgment.

11.10. Land Evacuation and Ditching

Please refer to FCOM/QRH.

11.11. Rejected Take-Off

Rejected Take-off

Rejected take-off is an unexpected stop on the runway during the take-off run. This is controlled from the flight deck and may be due to:

- An order from Air Traffic Control.
- A blockage on the active runway.
- A technical problem.

Rejected Landing

Rejected landing is where an aircraft suddenly climbs and has to 'go-around' instead of landing as expected.

This is controlled from the flight deck and may be due to:

- An order from Air Traffic Control.
- A blockage on the active runway.
- A technical problem.
- Adverse weather conditions.

Procedures in the Event of a Rejected Take-off

Please refer to QRH/FCOM

Procedures in the Event of a Rejected Landing

Please Refer to QRH/FCOM

11.12. Ground Based Emergency Services

As the vast majority of aircraft evacuations occur in close proximity to an airfield, following an evacuation Aircompany crewmember can usually expect to see representatives of the following emergency services:

- Fire Services
- Ambulance
- Airport Police
- Civil Police

The Senior Airport Fire Officer should be identified and informed of the total number on board, i.e., crew. Any questions should be answered as precisely as possible and every assistance offered in informing them of the layout and condition of the aircraft. Where many rescue vehicles are present, only the COMMAND fire vehicle keeps its flashing blue light on when stationary.

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12. AIRCRAFT SYSTEMS

Aircompany ensures that the contents of the AIRCRAFT SYSTEMS chapter, are presented in a form in which they can be used without difficulty.

The Aircompany ensures that a flight does not commence unless the instruments and equipment required under this paragraph are:

- Approved, except as specified, and installed in accordance with the requirements applicable to them, including the minimum performance standard and the operational and airworthiness requirements; and
- In operable condition for the kind of operation being conducted except as provided in the Minimum Equipment List.

Aircompany has guaranteed that the B737 aircraft is equipped and maintained in such manner to be in compliance with the requirements listed below:

- FM-Immunity of the VHF Communication and VHF Navigation Systems;
- “8,33 kHz Spacing” of the Communication System compatibility;
- “RNAV-5” and “RNP-1” (P-RNAV) in Terminal area
- “ACAS II/TCAS II”);
- “RVSM”
- “EGPWS”
- “EATC” (Enhanced ATC system with SSR mode A, C, S and flight ID);
- “Reinforced Cockpit Door” (ICAO Annex 6 AMD 27, CAP 13.2.2);
- “ELT – 406”

Reference: Aircraft Systems are described in respective FCOM.

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13. ATTACHMENT 1 – DE-/ANTI-ICING

13.1. AIRCRAFT DE-ICING/ANTI-ICING METHODS WITH FLUIDS

13.1.1. Scope

This section of the document establishes the minimum requirements for ground-based aircraft de-icing/anti-icing methods with fluids and procedures to facilitate the safe operation of transport aircrafts during icing conditions.

Frost, ice or snow deposits, which can seriously affect the aerodynamic performance and/or controllability of an aircraft, are effectively removed by the application of the procedures specified in this document.

13.1.2. General

A Commander shall not commence take-off unless the external surfaces are clear of any deposit which might adversely affect the performance and/or controllability of the aircraft except as permitted in the Airplane Flight Manual. For this reason a Contamination Check of the aircraft surfaces shall be performed prior to departure.

1.1. Contamination Check

This is a check for the need to de-ice. This check shall include the following:

1. Wings
2. Tail
3. Control surfaces
4. Pitot heads
5. Static ports
6. Engines
7. Air conditioning inlets
8. Exits
9. Landing gear
10. Landing gear doors
11. Fuel tank vents
12. Fuselage
13. Nose/radome area
14. Flight deck windows
15. Any other as recommended by the aircraft manufacturer.

It shall be performed from points offering sufficient visibility of these parts (e.g. from the de-icing vehicle itself or any other suitable piece of equipment).

Any contamination found, except frost mentioned in section 1.5.1.1 and 1.5.1.7, shall be removed by a de-icing treatment. If anti-icing is also required, this treatment may be performed as a one-step or two-step de-icing/anti-icing of the relevant surfaces.

Where an aircraft has been de-iced and/or anti-iced some time prior to the arrival of the Flight Crew, an additional ‘Contamination Check’ shall be carried out prior to departure, in order to establish whether further treatment is required.

Requests for de-icing/anti-icing shall specify the parts of the aircraft requiring treatment.

13.1.3. General Aircraft Requirements after De-Icing/Anti-Icing

13.1.3.1. Following the De-Icing/Anti-Icing Procedures and Prior to Takeoff, the Critical Aircraft Surfaces shall be Clean of all Frost, Ice, Slush, and Snow Accumulations in Accordance with the Following Requirements

13.1.3.2. Wings, Tail and Control Surfaces

Wings, tail and control surfaces shall be free of ice, snow, slush, and frost except that a coating of frost may be present on wing lower surfaces in areas cold soaked by fuel between forward and aft spars in accordance with the aircraft manufacturer’s published documentation.

Note: Frost or any other contamination is not acceptable on the lower side of the horizontal stabilizer and elevator, unless specified otherwise in the AFM or other aircraft manufacturer's documentation.

13.1.3.3. Pitot Heads and Static Ports

Pitot heads and static ports shall be clear of ice, frost, snow and fluid.

13.1.3.4. Engines

Engine inlets, exhaust nozzles, cooling intakes, control system probes and ports shall be clear of ice and snow. Engine fan blades or propellers (as appropriate) shall be clear of ice, frost and snow, and shall be free to rotate.

13.1.3.5. Air Conditioning Inlets and Exits

Air conditioning inlets and exits shall be clear of ice, frost and snow. Outflow valves shall be clear and unobstructed.

13.1.3.6. Landing Gear and Landing Gear Doors

Air conditioning inlets and exits shall be clear of ice, frost and snow. Outflow valves shall be clear and unobstructed.

13.1.3.7. Fuel Tank Vents

Fuel tank vents shall be clear of ice, frost and snow.

13.1.3.8. Fuselage

Fuselage shall be clear of snow, slush or ice. Frost may be present in accordance with the aircraft manufacturer's documentation.

13.1.3.9. Nose/Radome Area and Flight Deck Windows

Snow, slush, or ice on the windscreens or on areas forward of the windscreens shall be removed prior to departure (refer to section 1.5.1.7). Heated flight deck windows will not normally require de-icing.

13.1.3.10. Flight Control Check

A functional flight control check using an external observer may be required after de-icing/anti-icing depending upon aircraft type (see relevant manuals). This is particularly important in the case of an aircraft that has been subjected to an extreme ice or snow covering.

13.1.3.11. Dried Fluid Residues when the Aircraft has not been Flown after Anti-Icing

Dried fluid residue could occur when surfaces have been treated but the aircraft has not subsequently been flown and not been subject to precipitation. The fluid may then have dried on the surfaces. In such situations the aircraft must be checked for dried residues from de-icing/anti-icing fluids and cleaned as necessary.

13.1.3.12. Special Maintenance Considerations

Proper account should be taken of the possible side-effects of fluid use. Such effects may include, but are not necessarily limited to, dried and/or rehydrated residues, corrosion and the removal of lubricants.

13.2. Post De-Icing/Anti-Icing Check

An aircraft shall not be dispatched after a de-icing/anti-icing operation until the aircraft has received the following visual check by a trained and qualified person.

This check shall cover wings, horizontal stabilizer, vertical stabilizer and fuselage. This check shall also include any other parts of the aircraft on which a de-icing/anti-icing treatment was performed according to the requirements identified during the contamination check.

The check shall be performed from points offering sufficient visibility of all prescribed surfaces (e.g. from the de-icer itself or other equipment suitable for gaining access). Any contamination found, shall be removed by further de-icing/anti-icing treatment and the check repeated.

Before take-off the Commander must ensure that he has received confirmation that this Post De-icing/Anti-icing Check has been accomplished.

Where the de-icing provider is carrying out the de-icing/anti-icing process and also the Post De-icing/Anti-icing Check, it may either be performed as a separate check or incorporated into the de-icing operation as defined below.

The de-icing provider shall specify the actual method adopted, where necessary by customer, in his winter procedures:

a) As the de-icing/anti-icing operation progresses the De-icing Operator will closely monitor the surfaces receiving treatment, in order to ensure that all forms of frost, ice, slush or snow are removed and that, on completion of the treatment, these surfaces are fully covered with an adequate layer of anti-icing fluid.
b) Once the operation has been completed, the De-icing Operator will carry out a close visual check of the surface where treatment commenced, in order to ensure it has remained free of contamination (this procedure is not required under 'frost only' conditions).
c) Where the request for de-icing/anti-icing did not specify the fuselage, it shall also receive a visual check at this time, in order to confirm that it has remained free of contamination
d) Any evidence of contamination that is outside the defined limits shall be reported to the Commander immediately.

13.3. Pre-Takeoff Check

The Commander shall continually monitor the weather conditions after the performed de-icing/anti-icing treatment. Prior to takeoff he shall assess whether the applied holdover time is still appropriate and/or if untreated surfaces may have become contaminated.

This Check is normally performed from inside the flight deck.

13.3.1. Pre-Takeoff Contamination Check

This is a check of the critical surfaces for contamination.

This check shall be performed when the condition of the critical surfaces of the aircraft cannot be effectively assessed by a pre-takeoff check or when the applied holdover time has been exceeded.

This check is normally performed from outside the aircraft.

The alternate means of compliance to a pre-takeoff contamination check is a complete de-icing/anti-icing re-treatment of the aircraft.

13.3.2. Communication Procedures

The person communicating with the flight crew shall have a basic knowledge of the English language in order to communicate properly.

Communication between the Commander and the de-icing crew will usually be achieved using a combination of printed forms and verbal communication. For treatments carried out after aircraft doorsare closed, use of flight interphone (headset) or VHF radio will usually be required.

Use of hand signals is not recommended except for the final ‘all clear’ signal

13.3.3. Communication Prior to Starting De-icing/Anti-icing Treatment

I. Before de-icing/anti-icing, the Commander shall be requested to confirm the treatment required (areas to be de-iced, anti-icing requirements, special de-icing procedures).

II. Before fluid application starts, the Commander shall be requested to configure the aircraft for de-icing/anti-icing (surfaces, controls and systems, as per aircraft type requirements).

The de-icing crew shall wait for confirmation that this has been completed before commencing the treatment.

III. For treatments carried out without the flight crew present, a suitably qualified individual shall be nominated by the aircraft operator to confirm the treatment required and to confirm correct configuration of the aircraft.

13.3.4. Post De-Icing/Anti-Icing Communication

An aircraft shall not be dispatched for departure after a de-icing/anti-icing operation until the Commander has been notified of the type of de-icing/anti-icing operation performed (Anti-icing Code).

The Anti-icing Code shall be provided by a qualified person at the completion of the treatment, indicating that the checked surfaces are free of ice, frost, snow, and slush, and in addition includes the necessary information to allow the Commander to estimate the holdover time to be expected under the prevailing weather conditions

When a treatment is interrupted for a significant period of time (e.g. truck runs out of fluid) the flight crew shall be informed stating the reason, the action to be taken and the estimated time delay.

When continuing the treatment, the previously treated surfaces must be fully de-iced and anti-iced again, when the holdover time of the treatment from before the interruption is not sufficient.

A de-icing/anti-icing treatment should be continuous and as short as possible. If a treatment is interrupted (for example a truck ran out of fluid), the Aircraft Commander shall be immediately informed stating:

a) reason for interruption;
b) actions to be taken (in consultation with the Commander);
c) expected time of delay.

Before continuing the treatment:

a) inform the Commander;
b) establish in consultation with the Commander, further treatment to be carried out, including any surfaces requiring re-treatment (in relation to Holdover time).

Carry out treatment as agreed.

13.3.5. Anti-Icing Codes

See sec. 8.2.4.OM A

13.3.6. Post De-Icing/Anti-icing Check and Transmission of the Anti-icing Code to the Commander

It shall be clearly defined by the aircraft operator which company is responsible for carrying out the post de-icing/anti-icing check and providing the Commander with the Anti-icing Code.

If two different companies are involved in the de-icing/anti-icing treatment and post de-icing/anti-icing check, it must be ensured that the Anti-icing Code is not given before the post de-icing/anti-icing check is completed.

The company carrying out the de-icing/anti-icing treatment shall be responsible for the treatment and pass all information about the treatment to the company carrying out the post de-icing/anti-icing check.

13.3.7. All Clear Signal

The flight crew shall receive a confirmation from the ground crew that all de-icing/anti-icing operations are complete and that all personnel and equipment are clear before reconfiguring or moving the aircraft.

13.4.Holdover Time

See sec.8.2.4 OM A

13.5.LOCAL FROST PREVENTION IN COLD SOAKED WING AREAS

13.5.1. Introduction

Wing surface temperatures can be considerably below ambient due to contact with cold fuel and/or close proximity to large masses of cold soaked metal. In these areas frost can build up on wing surfaces and may result in the entire wing being de-iced/anti-iced prior to the subsequent departure.

This procedure provides recommendations for the prevention of local frost formation in cold soaked wing tank areas during transit stops in order to make de-icing/anti-icing of the entire wings unnecessary under such circumstances. This procedure does, however, not supersede standard de-icing/anti-icing procedures and has to fulfil the requirements of section 1. This procedure also does not relieve from any requirements for treatment and inspections in accordance with aircraft manufacturer's documentation.

13.5.2. Definitions

Local frost build-up: Limited formation of frost in local wing areas sub-cooled by cold fuel or large masses of cold metal; this type of frost does not cover the entire wing!

13.5.3. Procedure

Using suitable spray equipment, apply a proper coating of undiluted Type II or IV anti-icing fluid on the wings in the limited cold soaked areas where formation of frost may be expected due to contact of the wing skin with sub cooled fuel or masses of cold metal.

A proper coating completely covers the treated area with visible fluid.

13.5.4. Limits and Precautions

- This Local Frost Prevention procedure does not substitute standard de-icing/anti-icing procedures, clear ice checks or any other aircraft manufacturer requirements, nor the requirement that aircraft surfaces are clear of frost, slush, snow and ice accumulation.
- This Local Frost Prevention procedure shall only be carried out if approved by the operator of the aircraft to be treated, and it shall only be carried out by properly qualified and trained personnel.
- This Local Frost Prevention procedure shall be applied on clean wings immediately following arrival of the aircraft. Application is acceptable at the latest when frost just starts to build up, but in this case the fluid shall be applied at a minimum temperature of 50 °C (122 °F).

  If precipitation occurred between application of the fluid and dispatch of the aircraft and/or if precipitation is expected before takeoff, a standard de-icing/anti-icing treatment shall be performed.
- Both wings shall receive the same and symmetrical treatment, i.e. the same area in the same location shall be sprayed, also when conditions would not require the treatment of both wings.

  CAUTION: Aerodynamic problems could result if this requirement is not met.
- A holdover time shall not be assigned to a Local Frost Prevention procedure since the treatment does not cover the entire aircraft or wing surface respectively.

13.5.5. Final Check

A tactile check (by touch) of the treated areas and a visual check of the untreated areas of both wings shall be performed immediately before the aircraft leaves the parking position.

These checks are conducted to insure that both wings are clean and free of frost.

The applied de-icing/anti-icing fluid shall still be liquid and shall show no indication of failure, such as colour turning to white, loss of gloss, getting viscous, showing ice crystals etc.

13.5.6. Flight Crew Information

Following information shall be provided to the flight crew:

"Local frost prevention was accomplished".

13.6.OFF-GATE DE-ICING/ANTI-ICING PROCEDURES

13.6.1. Communications

During off-gate de-icing/anti-icing a two-way communication between flight crew and de-icing/anti-icing operator/supervisor must be established prior to the de-icing/anti-icing treatment.

This may be done either by intercom or by VHF radio. In case VHF is used, the register or "tail number" of the aircraft instead of flight number must be used during all communications.

During treatment all necessary information to cockpit must be given by this means (Beginning of treatment, treatment of sections requiring de-activation of aircraft systems, anti-icing code, etc.). Contact with flight crew may be closed after anti-icing code and readiness for taxi-out has been announced.

During de-icing/anti-icing operations with engines running, both verbal and visual communications are strongly recommended to control aircraft movement.

13.6.2. Taxi Guidance

When off-gate de-icing/anti-icing area is entered by taxiing, a sufficient taxi and stopping guidance must bebarranged, or marshaller assistance must be given. In case radio contact must be established before entering the de-icing/anti-icing area, the signs with clearly marked operation frequency must be visible from the cockpit before entering this area.

13.6.3. General Instructions

The de-icing/anti-icing operator together with the airport authorities must publish all necessary information about how to operate on the off-gate site by NOTAM or in local AIP. This information has to include at least the location of, and standard taxi routing to the de-icing/anti-icing area, means to coordinate the deicing/anti-icing operation, means to communicate before and during the de-icing/anti-icing operation, and information about taxi and stopping guidance.

13.6.4. Responsibilities

The responsibility to determine the need for de-icing/anti-icing before dispatch rests with the trained and qualified ground crew or flight crew who performs the Contamination Check at the gate. This information must be given in writing or verbally to the Commander of the aircraft, who is after that responsible to proceed in order to get proper treatment.

After treatment, the result must be checked by a trained and qualified person (see section 1.6) and the anti-icing code must be given to the Commander (see section 1.9.3), after which the Commander is responsible for the airworthiness of the aircraft.

13.6.5. Terminology

Following standard communication terminology is recommended during off-gate de-icing/anti-icing procedures:

(**DIS** = De-icing/anti-icing supervisor)

(**COMMANDER** = Pilot in command)

DIS: "Set parking-brakes, confirm aircraft is ready for treatment, inform on any special requests."

After aircraft is configured for treatment:

COMMANDER: "Brakes are set, you may begin treatment and observe ....

(any special requests like: ice under wing/flaps, clear-ice on top of wing, snow on fuselage, ice on landing-gear, anti-ice with Type IV fluid, etc.)".

DIS: "We begin treatment now and observe ....

(special request given, like "ice under wing", etc.).

I will call you back when ready".

Only after all equipment is cleared from aircraft and all checks are completed:

DIS: "De-icing/anti-icing completed, Anti-icing Code is: ....

(plus any additional info needed).

I am disconnecting.

Standby for clear signal at right/left and/or contact ground/tower for taxi clearance."

COMMANDER: "De-icing/anti-icing completed, Anti-icing code is ...."

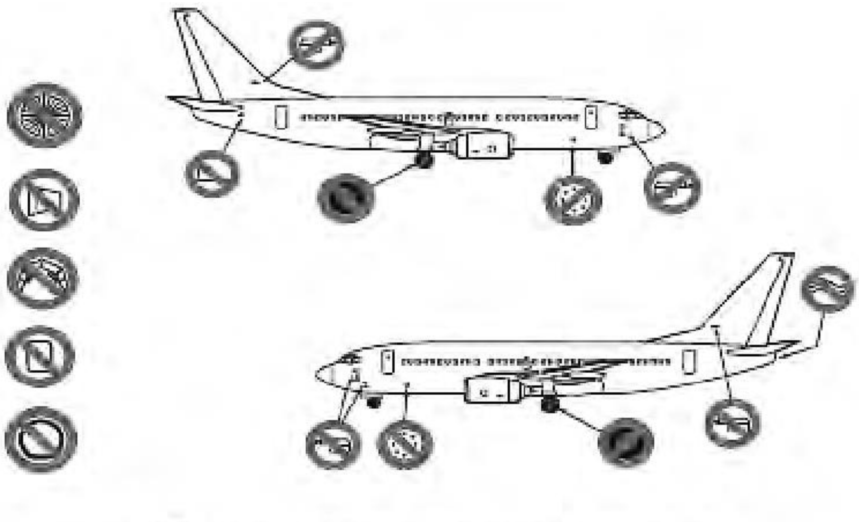
13.7. AIRCRAFT TYPES – ’NO SPRAY’ AREAS

The general restrictions below apply to all aircraft types. The list below states the requirements and the associated symbols, which are then used on the aircraft type diagrams on the following pages to indicate (where necessary) the locations of ‘no spray’ areas, for each of the aircraft types illustrated.

These illustrations are for general guidance only, and do not currently include every aircraft type and variant. Refer to the aircraft maintenance manual (AMM) or the Operator’s manual for further information.

In case of conflict, the AMM, or the Operator’s manual, takes preference.

- Do not spray into engine openings.
- Do not spray flight deck windows or windscreens.
- Do not spray main cabin windows.
- Do not spray directly at or into pitot probes, TAT probes, or angle of attack sensors.
- Do not spray directly at static ports.
- Do not spray into APU inlet.
- Do not spray into APU exhaust.
- Do not apply fluid to aircraft brakes.
- Do not spray into engine exhaust.
- Do not spray into aircraft exhaust or intake vents.
- Do not spray into avionic vents.
- Do not apply 100% Type II or IV to radome.
- 45° Apply deicing fluids at angles below 45 degrees.
- Do not spray onto propellor blades and into engine openings.



No direct application of de-/anti-icing fluids allowed

13.8.LIST OF FLUIDS

LIST OF FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(Notes 1-2 are located below)

Type I Deicing/Anti-Icing Fluids[1]	
Company Name	**Fluid Name**
ABAX Industries	DE-950
ABAX Industries	DE-950 Colorless
AllClear Systems	Lift-Off P-88
AllClear Systems	Lift-Off E-188
Arcton Ltd.	Arctica DG Ready to Use
Arcton Ltd.	Arctica DG 91 Concentrate
Aviation Shaanxi High-Tech Physical Co. Ltd.	Cleanwing I
Aviation Xi'an High-Tech	KHF-1
Beijing Phoenix Air Traffic Product Development and Trading Co.	CBSX-1
Beijing Wangye Aviation Chem. Prod. Co.	KLA-1
Beijing Yadilite Aviation Chemical Product Co. Ltd	YD-101 Type I
Clariant GmbH	EcoFlo Concentrate *(formerly Octagon EcoFlo)*
Clariant GmbH	EcoFlo 2 Concentrate *(formerly Octagon EcoFlo 2)*
Clariant GmbH	Octaflo EF Concentrate *(formerly Octagon Octaflo EF)*
Clariant GmbH	Octaflo EF 80 *(formerly Octagon Octaflo EF-80)*
Clariant GmbH	Octaflo EG Concentrate *(formerly Octagon Octaflo EG)*
Clariant GmbH	Safewing MP I 1938 ECO (80)
Clariant GmbH	Safewing MP I 1938 ECO (80) Pre-mix 55%
Clariant GmbH	Safewing MP I 1938 ECO
Clariant GmbH	Safewing EG I 1996
Clariant GmbH	Safewing EG I 1996 (88)
Clariant GmbH	Safewing MP I ECO PLUS (80)
Clariant GmbH	Safewing MP I SKY (80)
Cryotech Deicing Technology	Polar Plus
Cryotech Deicing Technology	Polar Plus (80)
Deicing Solutions LLC	Safetemp ES Plus
Dow Chemical Company	UCAR™ ADF Concentrate
Dow Chemical Company	UCAR™ ADF XL-54
Dow Chemical Company	UCAR™ PG ADF Concentrate
Dow Chemical Company	UCAR™ PG ADF Dilute 55/45
Harbin Aeroclean Aviation Tech Co. Ltd.	HJF-1
HOC Industries	SafeTemp ES Plus
Hokkaido NOF Corporation	Fever Snow AG
Inland Technologies	Duragly-E Concentrate
Inland Technologies	Duragly-P Concentrate
Kilfrost	Kilfrost DF PLUS
Kilfrost	Kilfrost DF PLUS (80)
Kilfrost	Kilfrost DF PLUS (88)
Kilfrost	Kilfrost DFsustain ™
LNT Solutions	E188
LNT Solutions	P180
LNT Solutions	P188
Newave Aerochemical Co. , Ltd	FCY-1A
Shanxi Cleanway Aviation Chemical Co. , Ltd.	Cleansurface I
Shanxi Cleanway Aviation Chemical Co. , Ltd.	Cleansurface I-BIO

Type II Deicing/Anti-Icing Fluids[2]	
Company Name	**Fluid Name**
ABAX Industries	Ecowing 26
Aviation Shaanxi Hi-Tech Physical Chemical Co., Ltd.	Cleanwing II
Clariant GmbH	Safewing MP II 1951
Clariant GmbH	Safewing MP II Flight
Clariant GmbH	Safewing MP II Flight Plus
Cryotech Deicing Technology	Polar Guard II
Kilfrost	Kilfrost ABC-3
Kilfrost	Kilfrost ABC-2000
Kilfrost	Kilfrost ABC-K PLUS
Newave Aerochemical Co Ltd.	FCY-2

Type III Deicing/Anti-Icing Fluids[2]	
Company Name	**Fluid Name**
Clariant GmbH	Safewing MP III 2031 ECO

Type IV Deicing/Anti-Icing Fluids[2]	
Company Name	**Fluid Name**
ABAX Industries	AD-480
ABAX Industries	Ecowing AD-49
Ckariant GmbH	MaxFlight 04 (formerly Octagon MaxFlight 04)
Clariant GmbH	Safewing MP IV LAUNCH
Clariant GmbH	Safewing MP IV LAUNCH PLUS
Cryotech Deicing Technology	Polar Guard
Cryotech Deicing Technology	Polar Guard Advance
Dow Chemical Company	UCAR™ Endurance EG106
Dow Chemical Company	UCAR™ FlightGuard AD-480
Dow Chemical Company	UCAR™ FlightGuard AD-49
Kilfrost	ABC-S
Kilfrost	ABC-S Plus
Lyondell Chemical Company	Shield™

Notes:

1. This table lists fluids that have been tested with respect to anti-icing performance requirements according to SAE AMS 1424, Paragraph 3.5.2 and aerodynamic performance according to SAE AMS 1424, Paragraph 3.5.3 only by the Anti-Icing Materials International Laboratory at the University of Quebec at Chicoutimi, Canada, web site: http://www.uqac.ca/amil/index.htm.The end user is responsible for confirming that other SAE AMS 1424 technical requirement tests, such as materials compatibility, and stability, etc, have been performed by contacting the fluid manufacturer.
2. This table lists Types II, III, or IV fluids that have been tested with respect to anti-icing performance requirements according to SAE AMS 1428, Paragraph 3.2.4 and aerodynamic performance according to SAE AMS 1428, Paragraph 3.2.5 only by the Anti-Icing Materials International Laboratory at the University of Quebec at Chicoutimi, Canada, web site: http://www.uqac.ca/amil/index.htm.The end user is responsible for confirming that other SAE AMS 1428 technical requirement tests, such as materials compatibility, and stability, etc, have been performed by contacting the fluid manufacturer.