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B-767-300

Operational Data

Manual

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FUNCTION

The Aircraft Operational Data Manual (ODM) serves to provide trained Delta Flight Operations and Operations Control personnel with some of the information and instructions necessary for safe and economical operation of the aircraft.

AUTHORITY

This manual is published by the General Manager – Performance Engineering, Dept. 088, ATL under the authority of the Vice President – Operations Reliability and Control.

The procedures and data contained in this manual include those in the FAA Approved Airplane Flight Manual and aircraft manufacturer's data.

RESPONSIBILITY

The General Manager – Performance Engineering has been designated the responsibility for the quality of this manual.

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Maintenance, safeguard, and revision of this manual are the responsibilities of the individual to whom it is issued.

All manual holders and users are encouraged to contribute their suggestions and criticisms regarding the manual so that its function is well served. Inputs concerning data and technical content should be addressed to Performance Engineering, Dept. 088, ATL.

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Revision Notification

Publication: B-767-300 OPERATIONAL DATA MANUAL

Date: 23 Sep 16

Revision Number: 80

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TOC/COVER PAGE	TOC/COVER PAGE	Cover page updated to reflect revision.
LIST OF EFFECTIVE PAGES Page <i>i</i>	LIST OF EFFECTIVE PAGES Page <i>i</i>	Insert immediately before Quick Reference tab.
QUICK REFERENCE Pages: All	QUICK REFERENCE Pages: All	Changed the table title and eliminated fair nomenclature to make it consistent with new FAA policy
ABNORMAL Pages: 4-1 & 4-33	QUICK REFERENCE Pages: 4-1 & 4-33	Updated title for Flaps Disagree table

**Pages not displaying a revision date of 23 Sep 16 were unchanged and included only for filing purposes.*

This list is effective with ODM Revision #80

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767-300 GE QUICK REFERENCE CHART

OPERATIONAL LANDING DISTANCES

RUNWAY CONDITION ASSESSMENT MATRIX

For additional guidance regarding the classification of the braking action based on existing contaminant types and the ICAO/Runway Condition Code values, please refer to Airway Manual, Supplemental, 4 – Weather, Braking Action.

Reported Braking Action		Reported Runway Surface Conditions			
PIREP	Definition	Runway Contaminant	ICAO/Runway Condition Code	Mu ⁽²⁾	RCR
--	--	• Dry	6		--
Good	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal	- Frost - Wet or Damp 1/8" or less depth of: - Water - Slush - Dry Snow - Wet Snow	5	40 or higher	19 & above
Good to Medium	Braking deceleration OR directional control is between Good and Medium.	-15°C and colder OAT: Compacted Snow	4	39 to 30	
Medium	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	- Wet ("slippery when wet" runway) - Dry Snow or Wet Snow (any depth) over Compacted Snow Greater than 1/8" depth of: - Dry Snow - Wet Snow Warmer than -15°C OAT: - Compacted Snow	3	29 to 21	13 – 18
Medium to Poor	Braking deceleration OR directional control is between Medium and Poor.	Greater than 1/8" depth of: - Water - Slush	2	20 or lower	
Poor	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	• Ice	1		6 – 12
Nil ⁽¹⁾	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	- Wet Ice - Water on top of Compacted Snow - Dry Snow or Wet Snow over Ice	0		5 & below
--	--	• Unreliable	9 (ICAO only)	N/A	N/A

⁽¹⁾ Operations on any runway with a PIREP or runway contaminant of nil are prohibited.

⁽²⁾ The overlapping Mu scales reflect the inherent inaccuracies of ground based Mu devices. Do not base the calculation of a landing distance solely on runway friction meter readings.

Braking actions "GOOD TO MEDIUM (4)" and "MEDIUM TO POOR (2)" are not displayed on the following pages. It is acceptable to interpolate between the provided data to calculate the desired landing performance when these conditions are present.

CROSSWIND

On slippery runways, crosswind guidelines are a function of runway surface condition, airplane loading and assume proper pilot technique.

	DRY	GOOD	MEDIUM	POOR
Crosswind Guidelines	40 kt	40 kt	35 kt	17 kt
Tailwind Limit	10 kt*	10 kt*	5 kt	0 kt

*Or as permitted by Delta 10-0 special pages.

767-300 GE QUICK REFERENCE CHART

OPERATIONAL LANDING DISTANCES FEET

FLAPS 25

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).									
	DRY (6)						GOOD (5)			
	AB 1	AB 2	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	11,300	10,400	9,100	7,800	6,200	5,400	9,100	7,800	6,500	6,400
340,000	11,000	10,100	8,900	7,600	6,100	5,200	8,900	7,700	6,400	6,300
330,000	10,800	9,900	8,700	7,500	6,000	5,100	8,700	7,500	6,200	6,200
320,000	10,500	9,700	8,500	7,300	5,800	5,000	8,500	7,300	6,100	6,100
310,000	10,200	9,400	8,300	7,200	5,700	4,900	8,300	7,200	6,000	5,900
300,000	9,900	9,200	8,100	7,000	5,600	4,700	8,100	7,000	5,900	5,800
295,000	9,800	9,100	8,000	6,900	5,600	4,700	8,000	6,900	5,800	5,700
290,000	9,700	8,900	7,900	6,800	5,500	4,600	7,900	6,900	5,700	5,700
280,000	9,400	8,700	7,700	6,700	5,400	4,500	7,700	6,700	5,600	5,600
270,000	9,100	8,500	7,500	6,500	5,300	4,400	7,500	6,500	5,500	5,400
260,000	8,800	8,200	7,300	6,400	5,200	4,200	7,300	6,400	5,400	5,300
250,000	8,500	8,000	7,100	6,200	5,000	4,100	7,100	6,200	5,200	5,200
240,000	8,300	7,700	6,900	6,000	4,900	4,000	6,900	6,100	5,100	5,100
230,000	8,000	7,500	6,700	5,900	4,800	3,900	6,700	5,900	5,000	4,900
220,000	7,700	7,200	6,500	5,700	4,700	3,700	6,500	5,700	4,800	4,800

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

 Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)						GOOD (5)			
0	-600	-600	-500	-400	-300	-200	-500	-400	-300	-300
2,000	0	0	0	0	0	0	0	0	0	0
4,000	600	600	500	400	300	200	500	400	300	300
6,000	1,200	1,100	900	700	600	500	900	700	600	600
8,000	1,900	1,700	1,400	1,100	800	700	1,400	1,100	900	900

CORRECTIONS	DRY (6)						GOOD (5)			
PER 1 KT HEADWIND	-50	-50	-50	-50	0	0	-50	-50	0	0
PER 1 KT TAILWIND	150	150	100	100	50	50	100	100	100	100
PER 5 KTS ADD'L SPD	350	400	450	350	250	200	450	350	250	200
PER 10°C ABOVE ISA	300	300	250	200	150	100	250	200	150	150
PER 10°C BELOW ISA	-300	-250	-250	-200	-150	-100	-250	-200	-150	-150
PER 1% UP SLOPE	-250	-150	0	0	0	-50	0	0	-50	-150
PER 1% DOWN SLOPE	200	100	0	0	0	100	0	0	100	150
1 REVERSER INOP	600	200	0	0	0	100	0	0	200	300
2 REVERSERS INOP	800	200	0	0	0	300	0	100	500	600
MANUAL SPOILERS	0	0	0	0	0	500	0	0	0	500

Note: Do not operate when Braking Action is Nil.

767-300 GE QUICK REFERENCE CHART

OPERATIONAL LANDING DISTANCES FEET

FLAPS 25

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).							
	MEDIUM (3)				POOR (1)			
	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	9,600	8,900	8,800	8,800	11,600	11,500	11,500	11,500
340,000	9,400	8,700	8,600	8,600	11,300	11,200	11,200	11,200
330,000	9,200	8,500	8,400	8,400	11,000	11,000	11,000	11,000
320,000	9,000	8,300	8,200	8,200	10,700	10,700	10,700	10,700
310,000	8,800	8,100	8,000	8,000	10,500	10,400	10,400	10,400
300,000	8,600	7,900	7,800	7,800	10,200	10,100	10,100	10,100
295,000	8,500	7,800	7,700	7,700	10,100	10,000	10,000	10,000
290,000	8,400	7,700	7,600	7,600	9,900	9,800	9,800	9,800
280,000	8,200	7,500	7,400	7,400	9,600	9,600	9,600	9,600
270,000	8,000	7,300	7,200	7,200	9,400	9,300	9,300	9,300
260,000	7,800	7,100	7,100	7,100	9,100	9,000	9,000	9,000
250,000	7,600	6,900	6,900	6,900	8,800	8,700	8,700	8,700
240,000	7,400	6,700	6,700	6,700	8,500	8,500	8,500	8,500
230,000	7,100	6,500	6,500	6,500	8,300	8,200	8,200	8,200
220,000	6,900	6,300	6,300	6,300	8,000	7,900	7,900	7,900

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

 Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	MEDIUM (3)				POOR (1)			
0	-500	-500	-500	-500	-700	-700	-700	-700
2,000	0	0	0	0	0	0	0	0
4,000	500	500	500	500	700	700	700	700
6,000	1,000	900	900	900	1,300	1,300	1,300	1,300
8,000	1,500	1,400	1,400	1,400	2,000	2,000	2,000	2,000

CORRECTIONS	MEDIUM (3)				POOR (1)			
PER 1 KT HEADWIND	-50	-50	-50	-50	-50	-50	-50	-50
PER 1 KT TAILWIND	150	150	150	150	250	250	250	250
PER 5 KTS ADD'L SPD	450	350	250	250	400	300	300	300
PER 10°C ABOVE ISA	250	250	200	200	300	300	300	300
PER 10°C BELOW ISA	-250	-200	-200	-200	-300	-300	-300	-300
PER 1% UP SLOPE	-150	-200	-300	-300	-500	-550	-550	-550
PER 1% DOWN SLOPE	200	300	400	350	850	900	900	900
1 REVERSER INOP	400	700	800	800	1,500	1,700	1,700	1,700
2 REVERSERS INOP	1,200	1,700	1,900	1,900	4,200	4,300	4,300	4,300
MANUAL SPOILERS	0	0	0	500	0	0	0	500

Note: Do not operate when Braking Action is Nil.

767-300 GE QUICK REFERENCE CHART

OPERATIONAL LANDING DISTANCES FEET

FLAPS 30

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).									
	DRY (6)						GOOD (5)			
	AB 1	AB 2	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	10,800	9,800	8,500	7,300	5,800	5,100	8,500	7,300	6,300	6,300
340,000	10,500	9,600	8,300	7,100	5,700	5,000	8,300	7,200	6,100	6,100
330,000	10,300	9,300	8,100	7,000	5,600	4,900	8,100	7,000	6,000	6,000
320,000	10,000	9,100	7,900	6,800	5,500	4,800	7,900	6,900	5,900	5,900
310,000	9,800	8,900	7,700	6,700	5,400	4,600	7,700	6,700	5,800	5,800
300,000	9,500	8,700	7,500	6,500	5,300	4,500	7,500	6,600	5,700	5,600
295,000	9,400	8,600	7,400	6,500	5,200	4,500	7,400	6,500	5,600	5,600
290,000	9,300	8,500	7,400	6,400	5,200	4,400	7,400	6,400	5,600	5,500
280,000	9,000	8,200	7,200	6,200	5,100	4,300	7,200	6,300	5,400	5,400
270,000	8,800	8,000	7,000	6,100	5,000	4,200	7,000	6,100	5,300	5,200
260,000	8,500	7,800	6,800	5,900	4,900	4,100	6,800	6,000	5,200	5,100
250,000	8,200	7,600	6,600	5,800	4,800	4,000	6,600	5,800	5,100	5,000
240,000	8,000	7,400	6,400	5,700	4,700	3,900	6,400	5,700	5,000	4,900
230,000	7,700	7,200	6,200	5,500	4,600	3,800	6,200	5,500	4,900	4,700
220,000	7,500	6,900	6,100	5,400	4,500	3,700	6,100	5,400	4,800	4,600

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

 Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)						GOOD (5)			
0	-600	-500	-400	-300	-300	-200	-400	-300	-300	-300
2,000	0	0	0	0	0	0	0	0	0	0
4,000	600	500	400	300	300	200	400	300	300	300
6,000	1,200	1,000	800	700	500	400	800	700	600	600
8,000	1,700	1,500	1,200	1,000	800	600	1,200	1,000	800	800

CORRECTIONS

	DRY (6)						GOOD (5)			
PER 1 KT HEADWIND	-50	-50	-50	-50	0	0	-50	-50	0	0
PER 1 KT TAILWIND	150	150	100	100	50	50	100	100	100	100
PER 5 KTS ADD'L SPD	350	400	400	350	250	150	400	350	250	200
PER 10°C ABOVE ISA	300	250	200	150	150	100	200	150	150	150
PER 10°C BELOW ISA	-300	-250	-200	-150	-150	-100	-200	-150	-150	-150
PER 1% UP SLOPE	-250	-100	0	0	0	-50	0	0	-100	-150
PER 1% DOWN SLOPE	150	0	0	0	0	100	0	0	150	150
1 REVERSER INOP	300	0	0	0	0	100	0	0	200	200
2 REVERSERS INOP	400	0	0	0	0	200	0	100	500	500
MANUAL SPOILERS	0	0	0	0	0	500	0	0	0	500

Note: Do not operate when Braking Action is Nil.

767-300 GE QUICK REFERENCE CHART

OPERATIONAL LANDING DISTANCES FEET

FLAPS 30

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).							
	MEDIUM (3)				POOR (1)			
	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	9,100	8,600	8,600	8,600	11,300	11,300	11,300	11,300
340,000	8,900	8,400	8,400	8,400	11,100	11,100	11,100	11,100
330,000	8,700	8,200	8,200	8,200	10,800	10,800	10,800	10,800
320,000	8,500	8,100	8,100	8,000	10,500	10,500	10,500	10,500
310,000	8,300	7,900	7,900	7,800	10,200	10,200	10,200	10,200
300,000	8,100	7,700	7,700	7,600	10,000	10,000	10,000	10,000
295,000	8,000	7,600	7,600	7,500	9,800	9,800	9,800	9,800
290,000	7,900	7,500	7,500	7,400	9,700	9,700	9,700	9,700
280,000	7,700	7,300	7,300	7,200	9,400	9,400	9,400	9,400
270,000	7,500	7,100	7,100	7,100	9,100	9,100	9,100	9,100
260,000	7,400	6,900	6,900	6,900	8,800	8,800	8,800	8,800
250,000	7,200	6,800	6,800	6,700	8,600	8,600	8,600	8,600
240,000	7,000	6,600	6,600	6,500	8,300	8,300	8,300	8,300
230,000	6,800	6,400	6,400	6,300	8,000	8,000	8,000	8,000
220,000	6,600	6,200	6,200	6,100	7,700	7,700	7,700	7,700

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.



Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	MEDIUM (3)				POOR (1)			
0	-500	-400	-400	-400	-600	-600	-600	-600
2,000	0	0	0	0	0	0	0	0
4,000	500	400	400	400	600	600	600	600
6,000	1,000	900	900	900	1,300	1,300	1,300	1,300
8,000	1,400	1,300	1,300	1,300	1,900	1,900	1,900	1,900

CORRECTIONS	MEDIUM (3)				POOR (1)			
PER 1 KT HEADWIND	-50	-50	-50	-50	-50	-50	-50	-50
PER 1 KT TAILWIND	150	150	150	150	250	250	250	250
PER 5 KTS ADD'L SPD	400	300	250	250	350	300	300	300
PER 10°C ABOVE ISA	250	200	200	200	300	300	300	300
PER 10°C BELOW ISA	-250	-200	-200	-200	-300	-300	-300	-300
PER 1% UP SLOPE	-150	-250	-300	-300	-550	-600	-600	-600
PER 1% DOWN SLOPE	250	400	400	400	950	950	950	950
1 REVERSER INOP	400	600	600	600	1,400	1,400	1,400	1,400
2 REVERSERS INOP	1,100	1,400	1,500	1,500	3,500	3,500	3,500	3,500
MANUAL SPOILERS	0	0	0	500	0	0	0	500

Note: Do not operate when Braking Action is Nil.

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DEFINITIONS AND ASSUMPTIONS

ISA - International Standard Atmosphere temperature, in °C, for a given pressure altitude. ISA temperature for Sea Level is 15°C (59°F).

ISA DEVIATION - The difference between the standard ISA temperature and the ambient temperature in °C.

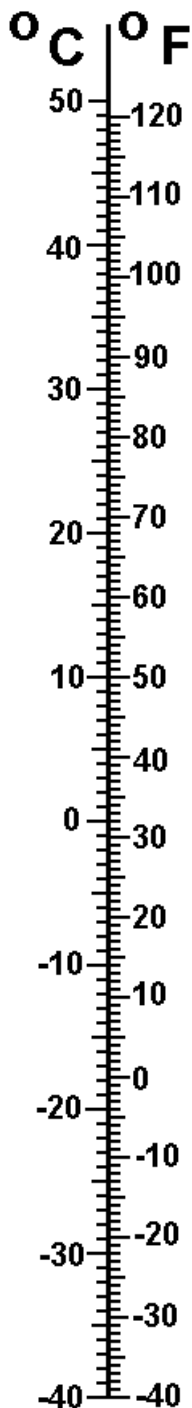
STATIC AIR TEMPERATURE (SAT) - The ambient still air temperature outside of the aircraft. Sometimes known as the Outside Air Temperature (OAT).

TOTAL AIR TEMPERATURE (TAT) - The total of the ambient air temperature (SAT) plus the increase in temperature due to compression heating.

V_{mo}/M_{mo} - Maximum allowable operating indicated airspeed or Mach number.

TEMPERATURE CONVERSION AND STATIC AIR TEMPERATURE

°C



ALTITUDE - FEET	ISA DEVIATION					
	ISA-20°C	ISA-10°C	ISA	ISA+10°C	ISA+20°C	ISA+30°C
36,000 & Higher	-76.5	-66.5	-56.5	-46.5	-36.5	-26.5
35,000	-74.2	-64.2	-54.2	-44.2	-34.2	-24.2
34,000	-72.3	-62.3	-52.3	-42.3	-32.3	-22.3
33,000	-70.3	-60.3	-50.3	-40.3	-30.3	-20.3
32,000	-68.3	-58.3	-48.3	-38.3	-28.3	-18.3
31,000	-66.3	-56.3	-46.3	-36.3	-26.3	-16.3
30,000	-64.3	-54.3	-44.3	-34.3	-24.3	-14.3
29,000	-62.4	-52.4	-42.4	-32.4	-22.4	-12.4
28,000	-60.4	-50.4	-40.4	-30.4	-20.4	-10.4
27,000	-58.4	-48.4	-38.4	-28.4	-18.4	-8.4
26,000	-56.5	-46.5	-36.5	-26.5	-16.5	-6.5
25,000	-54.5	-44.5	-34.5	-24.5	-14.5	-4.5
24,000	-52.5	-42.5	-32.5	-22.5	-12.5	-2.5
23,000	-50.5	-40.5	-30.5	-20.5	-10.5	-0.5
22,000	-48.5	-38.5	-28.5	-18.5	-8.5	+1.5
21,000	-46.6	-36.6	-26.6	-16.6	-6.6	+3.4
20,000	-44.6	-34.6	-24.6	-14.6	-4.6	+5.4
19,000	-42.6	-32.6	-22.6	-12.6	-2.6	+7.4
18,000	-40.6	-30.6	-20.6	-10.6	-0.6	+9.4
17,000	-38.7	-28.7	-18.7	-8.7	+1.3	+11.3
16,000	-36.7	-26.7	-16.7	-6.7	+3.3	+13.3
15,000	-34.7	-24.7	-14.7	-4.7	+5.3	+15.3
14,000	-32.7	-22.7	-12.7	-2.7	+7.3	+17.3
13,000	-30.7	-20.7	-10.7	-0.7	+9.3	+19.3
12,000	-28.8	-18.8	-8.8	+1.2	+11.2	+21.2
11,000	-26.8	-16.8	-6.8	+3.2	+13.2	+23.2
10,000	-24.8	-14.8	-4.8	+5.2	+15.2	+25.2
5000	-14.9	-4.9	+5.1	+15.1	+25.1	+35.1
0	-5.0	+5.0	+15.0	+25.0	+35.0	+45.0

RULE OF THUMB: For standard temperature (ISA) at or below 36,000 feet:

Double altitude (in thousands of feet), subtract 15, change sign.

EXAMPLES:	<u>ALT</u>	<u>DOUBLE ALT</u>	<u>SUBTRACT 15</u>	<u>CHANGE SIGN</u>
	0	0	-15	+15
	33	66	51	-51

TOTAL AIR TEMPERATURE vs STATIC AIR TEMPERATURE

°C

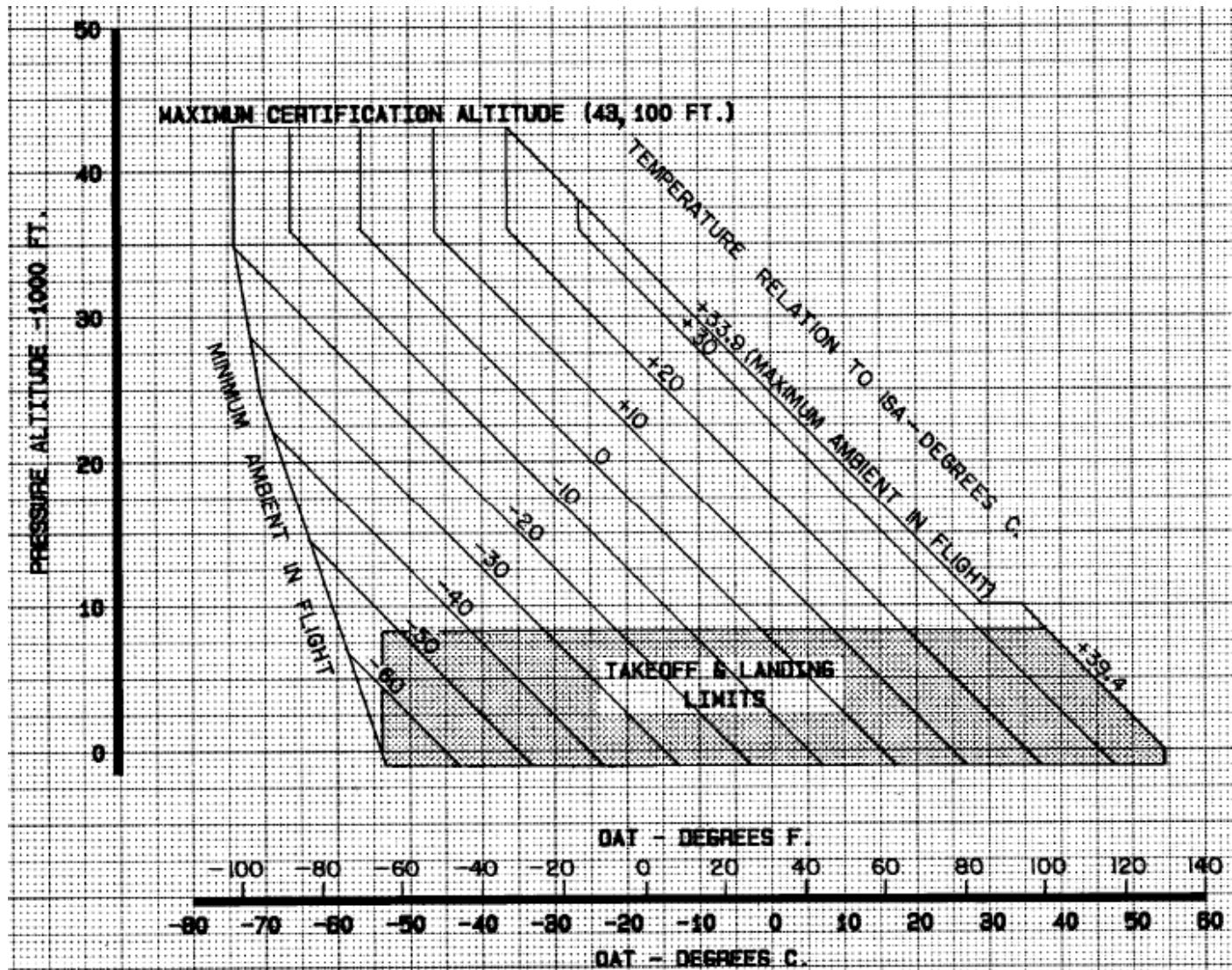
IND TAT °C	INDICATED MACH NUMBER													
	.40	.50	.60	.70	.74	.75	.76	.77	.78	.80	.82	.84	.86	.88
75	64	58	52	44	41	40	39	38	37	35	34	32	30	28
70	59	54	47	39	36	35	34	33	33	31	29	28	26	24
65	55	49	42	35	32	31	30	29	28	27	25	23	21	20
60	50	44	38	30	27	26	25	24	24	22	21	19	17	15
55	45	39	33	26	23	22	21	20	19	18	16	14	13	11
50	40	35	28	21	18	17	16	15	14	13	12	10	8	7
45	35	30	24	17	14	13	12	11	10	9	7	6	4	2
40	30	25	19	12	9	8	7	6	6	4	3	1	0	-2
35	25	20	14	7	5	4	3	2	1	0	-1	-3	-5	-6
30	21	16	10	3	0	-1	-2	-3	-3	-4	-6	-7	-9	-11
25	16	11	5	-2	-4	-5	-6	-7	-7	-9	-10	-12	-13	-15
20	11	6	0	-6	-9	-10	-11	-12	-12	-13	-15	-16	-18	-19
15	6	1	-4	-11	-13	-14	-15	-16	-16	-18	-19	-21	-22	-24
10	1	-3	-9	-15	-18	-19	-20	-21	-21	-22	-23	-25	-27	-28
5	-4	-8	-14	-20	-22	-23	-24	-25	-25	-27	-28	-29	-31	-32
0	-8	-13	-18	-24	-27	-28	-29	-30	-30	-31	-32	-34	-35	-37
-5	-13	-18	-23	-29	-31	-32	-33	-34	-34	-35	-37	-38	-40	-41
-10	-18	-23	-28	-33	-36	-37	-38	-39	-39	-40	-41	-43	-44	-45
-15	-23	-27	-32	-38	-40	-41	-42	-43	-43	-44	-46	-47	-48	-50
-20	-28	-32	-37	-43	-45	-46	-47	-48	-48	-49	-50	-51	-53	-54
-25	-33	-37	-42	-47	-49	-50	-51	-52	-52	-53	-54	-56	-57	-58
-30	-38	-42	-46	-52	-54	-54	-55	-55	-56	-58	-59	-60	-61	-63
-35	-42	-46	-51	-56	-58	-59	-60	-61	-61	-62	-63	-64	-66	-67
-40	-47	-51	-56	-61	-63	-63	-64	-64	-65	-66	-68	-69	-70	-71
-45	-52	-56	-60	-65	-67	-68	-69	-70	-70	-71	-72	-73	-74	-76
-50	-57	-61	-65	-70	-72	-72	-73	-73	-74	-75	-76	-78	-79	-80
-55	-62	-65	-70	-74	-76	-77	-78	-79	-79	-80	-81	-82	-83	-84

NORMAL OPERATING SPEED LIMIT

Vmo / Mmo

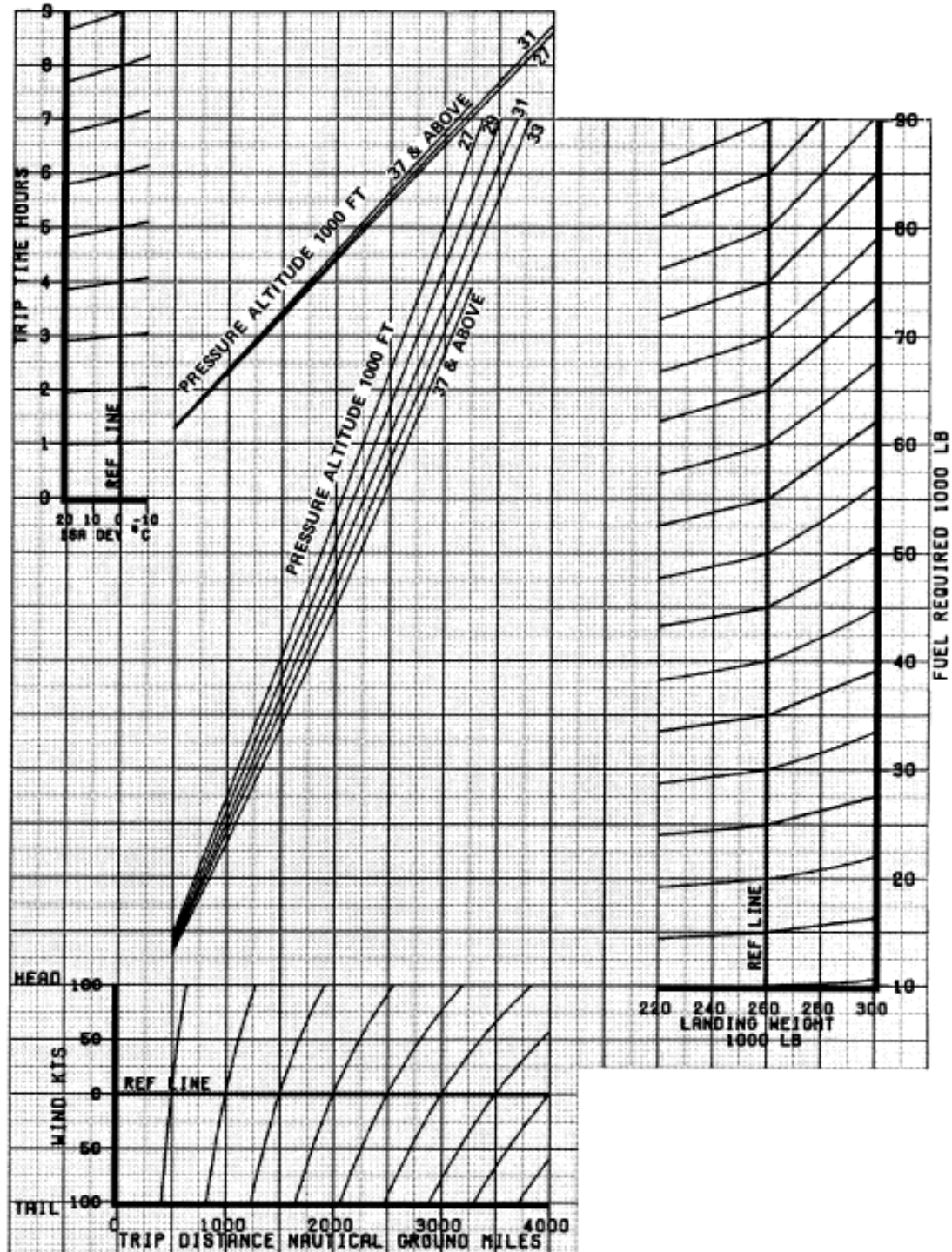
PRESSURE ALTITUDE	INDICATED Vmo (KIAS)	MACH Mmo
0	360	0.544
5,000	360	0.593
10,000	360	0.647
15,000	360	0.707
17,000	360	0.733
19,000	360	0.760
21,000	360	0.788
23,000	360	0.818
25,000	360	0.848
27,000	351	0.860
29,000	336	0.860
31,000	322	0.860
33,000	308	0.860
35,000	294	0.860
37,000	282	0.860
39,000	269	0.860
41,000	256	0.860
43,000	244	0.860

ENVIRONMENT ENVELOPE



TRIP FUEL ESTIMATE

- Climb @ 290/.78M
- Cruise @ .80M (Min Cost)
- Descent @ .78Mn/290/250



SHORT RANGE FLIGHTS FUEL CONSUMPTION TABLE

Standard Day

Block Time (minutes)	Block Fuel (pounds)
30	5,460
35	6,260
40	7,060
45	7,860
50	8,650
55	9,450
60	10,250
65	11,050
70	11,850
75	12,650
80	13,450

The above fuel consumptions are based on the following conditions:

1. Climb @ 250 KIAS / 300 KIAS / 0.80 Mach.
Cruise @ Minimum Cost Speed.
Descent @ 0.80 Mach / 300 KIAS / 250 KIAS.
2. Block (time / fuel) = Trip (time / fuel) + Ground Maneuver (time / fuel).
3. Ground Maneuver = Taxi Time = 15 minutes; taxi fuel = 740 lb.
4. Operational Landing Weight = 260,000 lb.

DRIFTDOWN NET LEVEL OFF ALTITUDE

(FOR FLIGHT PLANNING PURPOSES)

MAXIMUM CONTINUOUS THRUST

CF6-80A2 Engines

ENGINE ANTI-ICE OFF

GROSS WEIGHT – POUNDS		APPROX GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	OPTIMUM DRIFTDOWN SPEED - KIAS	ISA + 10°C & COLDER	ISA + 15°C	ISA + 20°C
360,000	346,000	250	12,400	12,300	10,600
340,000	327,000	250	14,300	14,200	13,200
320,000	309,000	249	16,700	16,600	15,500
300,000	290,000	241	18,600	18,500	17,600
280,000	272,000	232	20,400	20,300	19,400
260,000	253,000	223	22,200	22,100	21,200
240,000	233,000	213	24,000	24,000	23,100
220,000	214,000	204	26,100	26,000	25,100

ENGINE ANTI-ICE ON

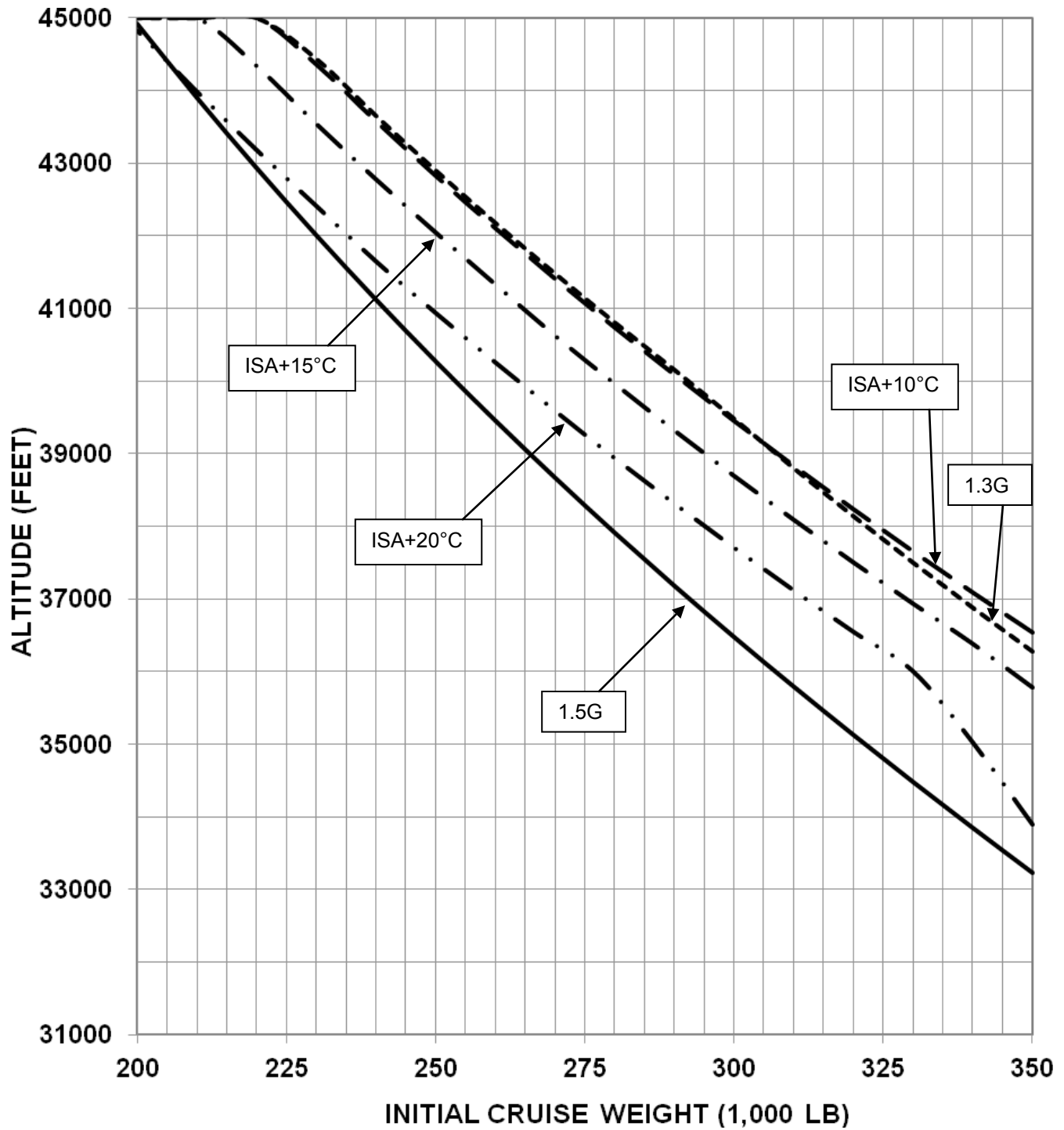
GROSS WEIGHT – POUNDS		APPROX GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	OPTIMUM DRIFTDOWN SPEED - KIAS	ISA + 10°C & COLDER	ISA + 15°C	ISA + 20°C
360,000	345,000	250	11,000	10,600	8,500
340,000	327,000	250	13,200	13,100	11,700
320,000	309,000	249	15,700	15,700	14,000
300,000	290,000	241	17,700	17,700	16,500
280,000	271,000	232	19,500	19,400	18,400
260,000	252,000	223	21,300	21,300	20,300
240,000	233,000	213	23,300	23,200	22,200
220,000	214,000	204	25,400	25,300	24,300

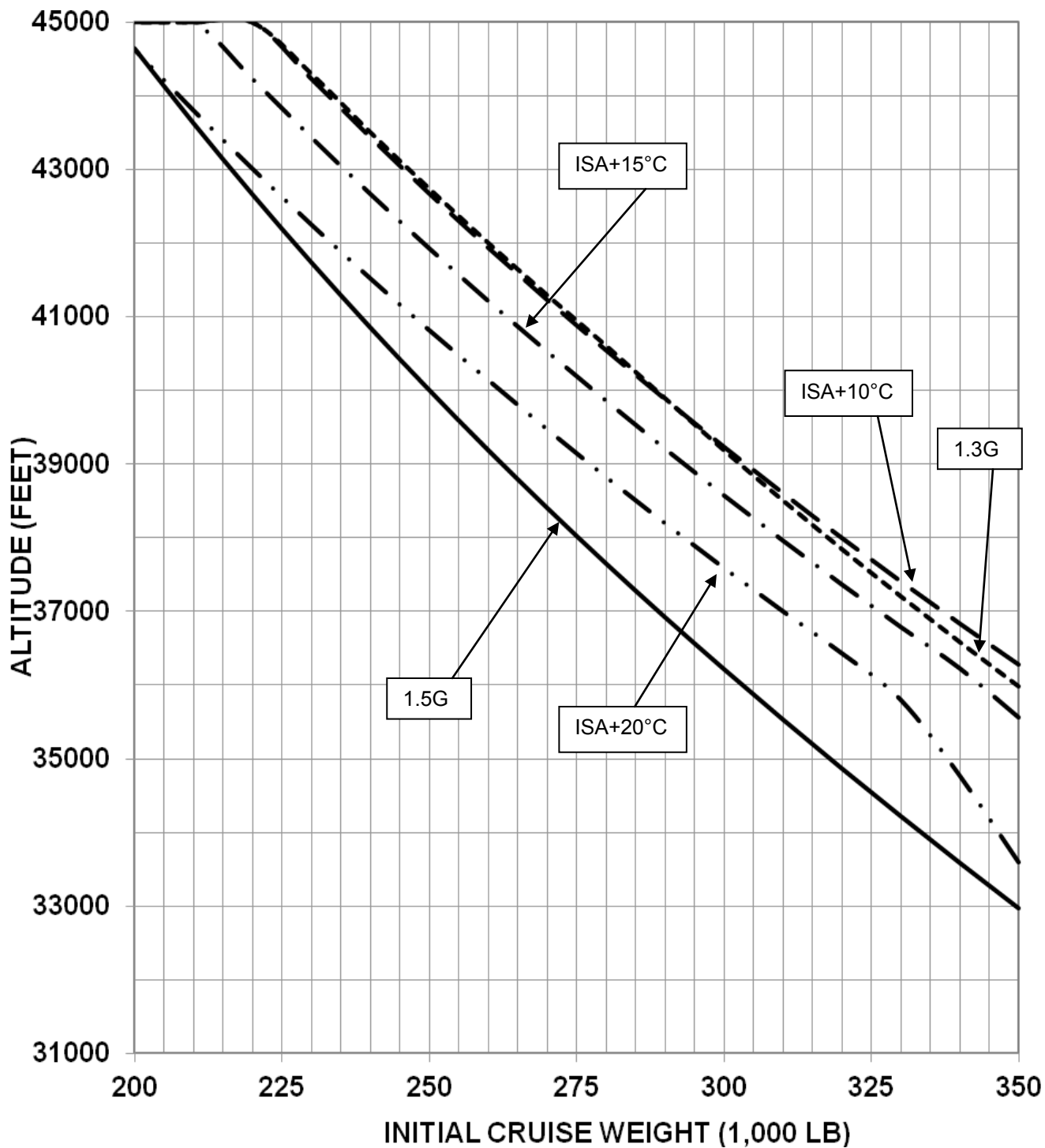
ENGINE & WING ANTI-ICE ON

GROSS WEIGHT – POUNDS		APPROX GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	OPTIMUM DRIFTDOWN SPEED - KIAS	ISA + 10°C & COLDER	ISA + 15°C	ISA + 20°C
360,000	344,000	250	9,800	9,200	7,000
340,000	327,000	250	12,300	12,200	10,100
320,000	307,000	249	14,300	14,200	13,000
300,000	290,000	241	17,100	17,000	15,600
280,000	271,000	232	18,900	18,800	17,800
260,000	252,000	223	20,800	20,700	19,600
240,000	233,000	213	22,700	22,700	21,600
220,000	214,000	204	24,800	24,800	23,700

BASIS:

- A/C Packs ON
- Maximum Continuous Thrust Limits
- 1.1% gradient decrement (net driftdown)
- 100 ft./min. residual rate of climb
- 35,000 ft. initial altitude

MAXIMUM RECOMMENDED INITIAL CRUISE ALTITUDE**LRC**

MAXIMUM RECOMMENDED INITIAL CRUISE ALTITUDE**MACH 0.81**

BUFFET ONSET BOUNDARY SPEEDS (KIAS)

FLIGHT LEVEL	CRUISE WEIGHT - POUNDS	V _b - KIAS (Mach)	G / BANK ANGLE - DEGREES					
			1.0 / 0°		1.15 / 30°		1.5 / 48°	
			LOW	HIGH	LOW	HIGH	LOW	HIGH
430	320	218 (0.78)	203	233				
	300		192	238				
	280		183	240	203	233		
	260		176	242	192	238		
	240		167	244+	182	242		
	220		158	244+	173	244+	210	228
410	320	229 (0.78)	197	250	223	236		
	300		189	252	208	240		
	280		181	255	197	250		
	260		173	256+	189	252		
	240		165	256+	180	252	217	240
	220		157	256+	171	252	202	248
390	320	241 (0.78)	194	268	213	259		
	300		188	269+	203	262		
	280		179	269+	194	268		
	260		172	269+	188	269+	223	247
	240		163	269+	178	269+	209	263
	220		157	269+	169	269+	198	266
370	320	252 (0.78)	192	282+	209	278		
	300		185	282+	201	280		
	280		178	282+	192	282+	230	264
	260		170	282+	185	282+	218	271
	240		163	282+	177	282+	207	280
	220		156	282+	168	282+	195	282+
350	320	264 (0.78)	190	294+	207	292	249	276
	300		183	294+	198	294+	235	280
	280		177	294+	190	294+	224	288
	260		169	294+	183	294+	214	292
	240		162	294+	175	294+	204	294+
	220		154	294+	167	294+	194	294+
330	320	277 (0.78)	188	308+	204	308+	241	308+
	300		183	308+	197	308+	231	308+
	280		177	308+	190	308+	222	308+
	260		168	308+	183	308+	212	308+
	240		162	308+	175	308+	203	308+
	220		154	308+	166	308+	193	308+
310	320	289 (0.78)	187	322+	203	322+	237	322+
	300		182	322+	195	322+	228	322+
	280		174	322+	189	322+	219	322+
	260		168	322+	182	322+	210	322+
	240		161	322+	174	322+	201	322+
	220		153	322+	165	322+	191	322+
290	320	290 (0.78)	187	336+	201	336+	235	336+
	300		180	336+	194	336+	226	336+
	280		173	336+	188	336+	217	336+
	260		167	336+	180	336+	209	336+
	240		160	336+	173	336+	199	336+
	220		152	336+	164	336+	190	336+

+ NOTE: Buffet Speeds shown with a **following + sign** are higher than the aircraft V_{mo}/M_{mo}.

The displayed speed is V_{mo}/M_{mo}.

 Aircraft is above buffet onset ceiling at this weight and altitude.

End of Section

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DEFINITIONS AND ASSUMPTIONS

AWABS	Automated Weight and Balance System. The computerized system for determining the weight & balance and airport performance.
AIRPORT PRESSURE ALTITUDE	The altitude read from the altimeter while sitting on the airport and adjusting the altimeter setting to 29.92 inches of mercury.
FMS	Flight Management System.
FMC	Flight Management Computer.
GWT	Gross Weight for Takeoff. The aircraft weight at the start of the takeoff roll.
N₁	Fan rotor speed in percent. Used as the primary thrust setting parameter for the CF6-80A2 engine.
V₁	Takeoff Decision Speed. V ₁ is the speed that determines a go or no-go decision in the event of an engine failure. No time is allowed after V ₁ for reaction or decision; action must be initiated at or before V ₁ . FAR, Part 25 defines V ₁ as "the speed at which an engine failure has been recognized and action initiated to either continue or stop the takeoff".
V_R	Rotation Speed. V _R is the speed at which the pilot begins to rotate the aircraft to the takeoff pitch attitude. V _R is selected so that, with a normal rate of rotation, the aircraft will lift off and attain a height of 35 feet at a speed of V ₂ .
V₂	Takeoff Safety Speed. V ₂ is the speed used to achieve the required gradient during second climb segment.

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DRY RUNWAY TAKEOFF SPEEDS – $V_1 / V_R / V_2$

CIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

DRY
TO / 15

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE – °C				
		10 & below	20	30	40	50
351,000	8,000	155 / 158 / 162	152 / 159 / 162	147 / 157 / 163	141 / 160 / 163	135 / 164 / 166
	6,000	156 / 157 / 161	156 / 157 / 161	155 / 158 / 162	151 / 157 / 163	145 / 161 / 164
	4,000	154 / 157 / 161	155 / 157 / 161	156 / 157 / 161	158 / 158 / 162	154 / 158 / 163
	2,000	153 / 156 / 161	153 / 156 / 160	153 / 156 / 161	156 / 157 / 161	159 / 159 / 162
	0	151 / 155 / 160	152 / 156 / 160	152 / 156 / 160	153 / 156 / 161	157 / 157 / 161
345,000	8,000	156 / 157 / 160	153 / 157 / 160	149 / 156 / 161	143 / 159 / 162	137 / 162 / 164
	6,000	154 / 156 / 160	154 / 156 / 160	157 / 157 / 160	153 / 156 / 161	147 / 159 / 162
	4,000	153 / 155 / 159	153 / 155 / 159	154 / 156 / 159	157 / 157 / 160	156 / 156 / 161
	2,000	151 / 155 / 159	151 / 155 / 159	152 / 155 / 159	155 / 156 / 159	157 / 157 / 160
	0	150 / 154 / 159	150 / 154 / 159	150 / 154 / 159	152 / 155 / 159	156 / 156 / 160
340,000	8,000	155 / 155 / 159	155 / 156 / 159	150 / 155 / 160	145 / 157 / 160	139 / 160 / 163
	6,000	153 / 154 / 158	153 / 154 / 158	155 / 155 / 159	154 / 155 / 160	149 / 158 / 161
	4,000	151 / 154 / 158	151 / 154 / 158	152 / 154 / 158	155 / 155 / 159	156 / 156 / 160
	2,000	150 / 153 / 158	150 / 153 / 158	150 / 153 / 158	153 / 154 / 158	156 / 156 / 159
	0	148 / 153 / 158	148 / 153 / 158	149 / 153 / 158	150 / 153 / 158	154 / 155 / 158
330,000	8,000	153 / 153 / 156	153 / 153 / 156	152 / 152 / 157	149 / 155 / 158	143 / 157 / 160
	6,000	150 / 152 / 156	150 / 152 / 156	153 / 153 / 156	153 / 153 / 157	153 / 155 / 158
	4,000	148 / 151 / 156	148 / 151 / 156	149 / 152 / 156	153 / 153 / 156	153 / 153 / 157
	2,000	147 / 151 / 156	147 / 151 / 156	147 / 151 / 156	150 / 152 / 156	153 / 153 / 156
	0	146 / 150 / 156	146 / 150 / 156	146 / 150 / 156	147 / 151 / 156	151 / 152 / 156
320,000	8,000	149 / 150 / 154	150 / 150 / 154	150 / 150 / 154	152 / 152 / 155	148 / 154 / 157
	6,000	146 / 149 / 153	147 / 149 / 153	149 / 150 / 154	150 / 150 / 154	152 / 152 / 155
	4,000	145 / 149 / 153	145 / 149 / 153	146 / 149 / 153	150 / 150 / 154	150 / 150 / 154
	2,000	144 / 148 / 153	144 / 148 / 153	144 / 148 / 153	147 / 149 / 153	150 / 150 / 154
	0	143 / 147 / 153	143 / 147 / 153	143 / 147 / 153	144 / 148 / 153	148 / 149 / 153
310,000	8,000	146 / 147 / 151	146 / 147 / 151	148 / 148 / 151	149 / 149 / 152	151 / 151 / 154
	6,000	143 / 146 / 151	143 / 146 / 151	146 / 147 / 151	148 / 148 / 151	149 / 149 / 152
	4,000	142 / 146 / 151	142 / 146 / 151	143 / 146 / 151	146 / 147 / 151	148 / 148 / 152
	2,000	141 / 145 / 151	141 / 145 / 151	141 / 145 / 151	143 / 146 / 151	147 / 147 / 151
	0	140 / 145 / 151	140 / 145 / 151	140 / 145 / 151	141 / 145 / 151	145 / 146 / 151
300,000	8,000	143 / 144 / 148	143 / 145 / 148	145 / 145 / 149	146 / 146 / 149	148 / 148 / 151
	6,000	140 / 144 / 148	140 / 144 / 148	143 / 144 / 148	145 / 145 / 149	147 / 147 / 149
	4,000	139 / 143 / 148	139 / 143 / 148	140 / 143 / 148	143 / 145 / 148	146 / 146 / 149
	2,000	138 / 142 / 148	138 / 142 / 148	138 / 143 / 148	140 / 144 / 148	145 / 145 / 148
	0	137 / 142 / 148	137 / 142 / 148	137 / 142 / 148	138 / 143 / 148	142 / 144 / 148
290,000	8,000	139 / 142 / 146	139 / 142 / 146	142 / 143 / 146	144 / 144 / 146	145 / 145 / 147
	6,000	137 / 141 / 145	137 / 141 / 145	139 / 142 / 146	142 / 143 / 146	144 / 144 / 147
	4,000	136 / 140 / 145	136 / 140 / 145	137 / 141 / 145	140 / 142 / 146	143 / 143 / 146
	2,000	135 / 140 / 145	135 / 140 / 145	135 / 140 / 145	137 / 141 / 145	141 / 142 / 146
	0	134 / 139 / 145	134 / 139 / 145	134 / 139 / 145	135 / 140 / 145	138 / 141 / 145
280,000	8,000	136 / 139 / 143	136 / 139 / 143	139 / 140 / 143	141 / 141 / 144	142 / 142 / 145
	6,000	134 / 138 / 143	134 / 138 / 143	136 / 139 / 143	139 / 140 / 143	141 / 141 / 144
	4,000	133 / 137 / 143	133 / 137 / 143	134 / 138 / 143	137 / 139 / 143	140 / 140 / 143
	2,000	132 / 137 / 143	132 / 137 / 143	132 / 137 / 143	134 / 138 / 143	138 / 139 / 143
	0	131 / 136 / 143	131 / 136 / 143	131 / 136 / 143	132 / 137 / 143	135 / 138 / 143

DRY RUNWAY TAKEOFF SPEEDS – $V_1 / V_R / V_2$

KIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

DRY
TO / 15

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE – °C				
		10 & below	20	30	40	50
270,000	8,000	133 / 136 / 141	133 / 136 / 141	135 / 137 / 141	138 / 138 / 141	139 / 139 / 141
	6,000	131 / 135 / 141	131 / 135 / 141	133 / 136 / 141	135 / 137 / 141	138 / 138 / 141
	4,000	130 / 134 / 141	130 / 134 / 141	130 / 135 / 141	133 / 136 / 141	137 / 137 / 141
	2,000	129 / 134 / 141	129 / 134 / 141	129 / 134 / 141	131 / 135 / 141	135 / 136 / 141
	0	127 / 133 / 140	127 / 133 / 140	127 / 133 / 140	129 / 134 / 140	131 / 135 / 140
260,000	8,000	129 / 133 / 138	130 / 133 / 138	132 / 134 / 138	135 / 135 / 138	136 / 136 / 138
	6,000	127 / 132 / 138	128 / 132 / 138	129 / 133 / 138	132 / 134 / 138	135 / 135 / 138
	4,000	126 / 131 / 138	126 / 131 / 138	127 / 132 / 138	130 / 133 / 138	133 / 134 / 138
	2,000	125 / 131 / 138	125 / 131 / 138	126 / 131 / 138	128 / 132 / 138	131 / 133 / 138
	0	124 / 130 / 138	124 / 130 / 138	124 / 130 / 138	126 / 131 / 138	128 / 132 / 138
250,000	8,000	126 / 130 / 135	126 / 130 / 135	128 / 131 / 135	131 / 132 / 135	133 / 133 / 136
	6,000	124 / 129 / 135	124 / 129 / 135	126 / 130 / 135	128 / 131 / 135	132 / 132 / 135
	4,000	123 / 128 / 135	123 / 128 / 135	124 / 129 / 135	127 / 130 / 135	129 / 131 / 135
	2,000	121 / 128 / 135	122 / 128 / 135	123 / 128 / 135	124 / 129 / 135	128 / 130 / 135
	0	119 / 127 / 135	120 / 127 / 135	120 / 127 / 135	122 / 128 / 135	125 / 129 / 135
240,000	8,000	123 / 127 / 133	123 / 127 / 133	125 / 128 / 133	127 / 129 / 133	130 / 130 / 133
	6,000	121 / 126 / 133	121 / 126 / 133	123 / 127 / 133	125 / 128 / 133	128 / 129 / 133
	4,000	120 / 125 / 133	120 / 125 / 133	121 / 126 / 133	123 / 127 / 133	126 / 128 / 133
	2,000	118 / 124 / 133	118 / 124 / 133	119 / 124 / 133	121 / 126 / 133	124 / 127 / 133
	0	115 / 124 / 133	116 / 124 / 133	116 / 124 / 133	118 / 125 / 133	122 / 126 / 133
230,000	8,000	119 / 123 / 130	119 / 124 / 130	121 / 125 / 130	124 / 126 / 130	126 / 127 / 130
	6,000	117 / 123 / 130	118 / 123 / 130	119 / 124 / 130	121 / 125 / 130	124 / 126 / 130
	4,000	116 / 122 / 130	116 / 122 / 130	117 / 122 / 130	120 / 124 / 130	122 / 125 / 130
	2,000	115 / 121 / 130	115 / 121 / 130	115 / 121 / 130	117 / 123 / 130	121 / 124 / 130
	0	112 / 120 / 130	112 / 120 / 130	113 / 121 / 130	114 / 121 / 130	118 / 123 / 130
220,000	8,000	116 / 120 / 127	116 / 120 / 127	118 / 121 / 127	120 / 122 / 127	122 / 124 / 127
	6,000	114 / 119 / 127	114 / 119 / 127	116 / 120 / 127	118 / 121 / 127	120 / 123 / 127
	4,000	111 / 118 / 127	112 / 118 / 127	113 / 119 / 127	116 / 120 / 127	119 / 122 / 127
	2,000	110 / 118 / 127	110 / 118 / 127	110 / 118 / 127	113 / 119 / 127	117 / 121 / 127
	0	109* / 117 / 127	109 / 117 / 127	110 / 117 / 127	110 / 118 / 127	114 / 120 / 127
210,000	8,000	112 / 117 / 124	112 / 117 / 124	114 / 118 / 124	116 / 119 / 124	118 / 120 / 124
	6,000	110 / 116 / 124	110 / 116 / 124	112 / 117 / 124	114 / 118 / 124	117 / 119 / 124
	4,000	109 / 115 / 124	109 / 115 / 124	110 / 116 / 124	113 / 117 / 124	115 / 118 / 124
	2,000	108 / 114 / 124	108 / 114 / 124	108 / 115 / 124	110 / 116 / 124	114 / 117 / 124
	0	109* / 113 / 125	109* / 114 / 125	109* / 114 / 125	109 / 115 / 124	110 / 116 / 124
200,000	8,000	108 / 113 / 121	108 / 113 / 121	111 / 114 / 121	113 / 116 / 121	115 / 117 / 121
	6,000	105 / 112 / 121	105 / 112 / 121	108 / 113 / 121	110 / 115 / 121	113 / 116 / 121
	4,000	105 / 112 / 121	105 / 112 / 121	105 / 112 / 121	108 / 113 / 121	111 / 115 / 121
	2,000	107* / 111 / 121	106* / 111 / 121	106* / 111 / 121	105 / 112 / 121	109 / 114 / 121
	0	109* / 112 / 123	109* / 112 / 123	109* / 112 / 123	106* / 111 / 121	106 / 113 / 121

NOTE:

Speeds denoted by an asterisk (*) are V_{MCG} limited.

DRY RUNWAY TAKEOFF SPEEDS – $V_1 / V_R / V_2$

CIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

DRY
TO / 5

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE – °C				
		10 & below	20	30	40	50
351,000	8,000	154 / 168 / 170	151 / 168 / 170	148 / 170 / 171	145 / 169 / 172	140 / 172 / 174
	6,000	160 / 167 / 170	157 / 167 / 170	154 / 168 / 171	151 / 169 / 170	148 / 169 / 172
	4,000	162 / 166 / 169	162 / 167 / 169	161 / 167 / 170	158 / 168 / 171	155 / 169 / 170
	2,000	161 / 166 / 169	161 / 166 / 169	161 / 166 / 169	164 / 167 / 170	162 / 168 / 171
	0	160 / 165 / 169	160 / 165 / 169	160 / 166 / 169	161 / 166 / 169	165 / 167 / 170
345,000	8,000	155 / 166 / 169	152 / 166 / 168	150 / 169 / 169	146 / 167 / 170	142 / 170 / 172
	6,000	161 / 165 / 168	159 / 166 / 168	156 / 166 / 169	153 / 167 / 169	150 / 167 / 170
	4,000	160 / 165 / 168	160 / 165 / 168	161 / 165 / 168	160 / 166 / 168	157 / 168 / 169
	2,000	159 / 164 / 168	159 / 164 / 168	159 / 164 / 168	162 / 165 / 168	164 / 167 / 169
	0	158 / 164 / 168	158 / 164 / 168	158 / 164 / 168	159 / 164 / 168	163 / 166 / 168
340,000	8,000	157 / 165 / 167	154 / 165 / 167	151 / 167 / 168	148 / 166 / 169	144 / 168 / 169
	6,000	160 / 164 / 167	160 / 164 / 167	158 / 165 / 167	155 / 166 / 167	152 / 166 / 169
	4,000	159 / 163 / 167	159 / 164 / 167	160 / 164 / 167	162 / 165 / 168	159 / 166 / 167
	2,000	157 / 163 / 167	158 / 163 / 167	158 / 163 / 167	160 / 164 / 167	164 / 165 / 168
	0	156 / 162 / 167	157 / 162 / 167	157 / 162 / 167	158 / 163 / 167	162 / 164 / 167
330,000	8,000	159 / 162 / 165	157 / 162 / 164	154 / 164 / 165	151 / 163 / 166	147 / 165 / 167
	6,000	157 / 161 / 164	157 / 161 / 164	159 / 162 / 165	158 / 163 / 165	155 / 163 / 166
	4,000	155 / 161 / 164	156 / 161 / 164	156 / 161 / 164	160 / 162 / 165	162 / 163 / 165
	2,000	154 / 160 / 164	155 / 160 / 164	155 / 160 / 164	157 / 161 / 164	162 / 162 / 165
	0	153 / 160 / 164	154 / 160 / 164	154 / 160 / 164	155 / 160 / 164	158 / 161 / 164
320,000	8,000	156 / 159 / 162	157 / 159 / 162	157 / 161 / 162	154 / 161 / 163	150 / 162 / 164
	6,000	154 / 158 / 162	154 / 158 / 162	156 / 159 / 162	159 / 160 / 162	158 / 161 / 163
	4,000	152 / 158 / 162	153 / 158 / 162	153 / 158 / 162	157 / 159 / 162	160 / 161 / 162
	2,000	151 / 157 / 162	152 / 157 / 162	152 / 157 / 162	154 / 158 / 162	158 / 160 / 162
	0	150 / 157 / 162	151 / 157 / 162	151 / 157 / 162	152 / 157 / 162	155 / 159 / 162
310,000	8,000	153 / 156 / 159	153 / 157 / 159	156 / 157 / 160	157 / 158 / 160	154 / 159 / 161
	6,000	151 / 156 / 159	151 / 156 / 159	153 / 157 / 159	156 / 157 / 160	158 / 158 / 160
	4,000	149 / 155 / 159	150 / 155 / 159	150 / 156 / 159	154 / 157 / 159	157 / 158 / 160
	2,000	149 / 154 / 159	149 / 154 / 159	149 / 155 / 159	151 / 156 / 159	155 / 157 / 159
	0	148 / 154 / 159	148 / 154 / 159	148 / 154 / 159	149 / 155 / 159	152 / 156 / 159
300,000	8,000	149 / 153 / 156	150 / 153 / 156	152 / 154 / 157	155 / 155 / 157	156 / 156 / 158
	6,000	147 / 153 / 156	147 / 153 / 156	149 / 153 / 156	152 / 154 / 157	155 / 155 / 157
	4,000	146 / 152 / 156	146 / 152 / 156	147 / 152 / 156	150 / 153 / 156	154 / 155 / 157
	2,000	145 / 151 / 156	146 / 151 / 156	146 / 152 / 156	148 / 153 / 156	151 / 154 / 157
	0	144 / 151 / 156	145 / 151 / 156	145 / 151 / 156	146 / 152 / 156	149 / 153 / 156
290,000	8,000	146 / 151 / 154	147 / 151 / 154	149 / 152 / 154	152 / 153 / 154	154 / 154 / 155
	6,000	144 / 150 / 154	144 / 150 / 154	146 / 151 / 154	149 / 152 / 154	152 / 153 / 155
	4,000	143 / 149 / 154	143 / 149 / 154	144 / 150 / 154	147 / 151 / 154	150 / 152 / 154
	2,000	142 / 148 / 154	142 / 148 / 154	143 / 149 / 154	145 / 150 / 154	148 / 151 / 154
	0	142 / 148 / 154	142 / 148 / 154	142 / 148 / 154	143 / 149 / 154	145 / 150 / 154
280,000	8,000	143 / 147 / 151	143 / 148 / 151	145 / 148 / 151	149 / 149 / 152	150 / 150 / 152
	6,000	141 / 147 / 151	141 / 147 / 151	143 / 147 / 151	145 / 148 / 151	149 / 150 / 152
	4,000	140 / 146 / 151	140 / 146 / 151	141 / 146 / 151	144 / 148 / 151	146 / 149 / 151
	2,000	139 / 145 / 151	139 / 145 / 151	139 / 145 / 151	141 / 147 / 151	144 / 148 / 151
	0	138 / 145 / 151	138 / 145 / 151	138 / 145 / 151	139 / 146 / 151	142 / 147 / 151

DRY RUNWAY TAKEOFF SPEEDS – V_1 / V_R / V_2

CIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

DRY
TO / 5

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE – °C				
		10 & below	20	30	40	50
270,000	8,000	140 / 144 / 148	140 / 144 / 148	142 / 145 / 148	145 / 146 / 149	147 / 147 / 149
	6,000	138 / 144 / 148	138 / 144 / 148	140 / 144 / 148	142 / 145 / 148	145 / 147 / 149
	4,000	137 / 143 / 148	137 / 143 / 148	138 / 143 / 148	140 / 144 / 148	143 / 146 / 148
	2,000	136 / 142 / 148	136 / 142 / 148	136 / 142 / 148	138 / 143 / 148	141 / 145 / 148
	0	134 / 142 / 148	135 / 142 / 148	135 / 142 / 148	136 / 142 / 148	139 / 144 / 148
260,000	8,000	136 / 141 / 146	137 / 141 / 146	139 / 142 / 146	141 / 143 / 146	143 / 144 / 146
	6,000	135 / 140 / 146	135 / 140 / 146	136 / 141 / 146	138 / 142 / 146	141 / 144 / 146
	4,000	133 / 140 / 146	134 / 140 / 146	134 / 140 / 146	137 / 141 / 146	139 / 143 / 145
	2,000	132 / 139 / 146	132 / 139 / 146	133 / 139 / 146	135 / 140 / 146	138 / 142 / 146
	0	130 / 138 / 146	130 / 138 / 146	131 / 138 / 146	133 / 139 / 146	135 / 141 / 146
250,000	8,000	133 / 138 / 143	133 / 138 / 143	135 / 139 / 143	137 / 140 / 143	140 / 141 / 143
	6,000	131 / 137 / 143	131 / 137 / 143	133 / 138 / 143	135 / 139 / 143	138 / 140 / 143
	4,000	130 / 136 / 143	130 / 136 / 143	131 / 137 / 143	133 / 138 / 143	136 / 140 / 143
	2,000	128 / 136 / 143	128 / 136 / 143	129 / 136 / 143	131 / 137 / 143	133 / 139 / 143
	0	127 / 135 / 143	127 / 135 / 143	128 / 135 / 143	129 / 136 / 143	132 / 137 / 143
240,000	8,000	129 / 135 / 140	130 / 135 / 140	132 / 136 / 140	134 / 137 / 140	136 / 138 / 140
	6,000	128 / 134 / 140	128 / 134 / 140	130 / 135 / 140	131 / 136 / 140	134 / 137 / 140
	4,000	126 / 133 / 140	126 / 133 / 140	127 / 134 / 140	130 / 135 / 140	132 / 136 / 140
	2,000	123 / 132 / 140	124 / 133 / 140	125 / 133 / 140	128 / 134 / 140	131 / 135 / 140
	0	120 / 132 / 140	121 / 132 / 140	122 / 132 / 140	124 / 133 / 140	128 / 134 / 140
230,000	8,000	126 / 131 / 137	126 / 132 / 137	128 / 132 / 137	130 / 134 / 137	132 / 135 / 137
	6,000	124 / 130 / 137	124 / 130 / 137	126 / 131 / 137	128 / 133 / 137	130 / 134 / 137
	4,000	123 / 130 / 137	123 / 130 / 137	124 / 130 / 137	126 / 132 / 137	129 / 133 / 137
	2,000	117 / 129 / 137	119 / 129 / 137	122 / 129 / 137	124 / 130 / 137	127 / 132 / 137
	0	115 / 128 / 134	115 / 128 / 134	115 / 128 / 134	119 / 129 / 134	124 / 131 / 134
220,000	8,000	122 / 128 / 134	122 / 128 / 134	124 / 129 / 134	126 / 130 / 134	128 / 131 / 134
	6,000	120 / 127 / 134	120 / 127 / 134	122 / 128 / 134	124 / 129 / 134	127 / 130 / 134
	4,000	117 / 126 / 134	117 / 126 / 134	119 / 127 / 134	122 / 128 / 134	125 / 129 / 134
	2,000	112 / 125 / 134	114 / 125 / 134	115 / 125 / 134	119 / 127 / 134	123 / 128 / 134
	0	110 / 125 / 134	110 / 125 / 134	109 / 125 / 134	114 / 126 / 134	120 / 127 / 134
210,000	8,000	118 / 124 / 131	119 / 124 / 131	120 / 125 / 131	123 / 127 / 131	124 / 128 / 131
	6,000	116 / 123 / 131	117 / 123 / 131	118 / 124 / 131	120 / 125 / 131	123 / 127 / 131
	4,000	115 / 122 / 131	115 / 122 / 131	116 / 123 / 131	119 / 124 / 131	121 / 126 / 131
	2,000	111 / 122 / 131	113 / 122 / 131	114 / 122 / 131	117 / 123 / 131	120 / 125 / 131
	0	110 / 121 / 131	110 / 121 / 131	110 / 121 / 131	110 / 122 / 131	115 / 124 / 131
200,000	8,000	113 / 121 / 128	114 / 121 / 128	116 / 122 / 128	119 / 123 / 128	121 / 124 / 128
	6,000	110 / 120 / 128	110 / 120 / 128	113 / 121 / 128	116 / 122 / 128	119 / 123 / 128
	4,000	106 / 119 / 128	107 / 119 / 128	109 / 119 / 128	113 / 121 / 128	117 / 122 / 128
	2,000	107* / 118 / 128	106* / 118 / 128	106* / 118 / 128	109 / 120 / 128	114 / 121 / 128
	0	109* / 117 / 128	109* / 117 / 128	109* / 117 / 128	106* / 118 / 128	110 / 120 / 128

NOTE:

Speeds denoted by an asterisk (*) are V_{MCG} limited.

TAKEOFF STABILIZER SETTINGS

UNITS AIRPLANE NOSE UP

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

GROSS WEIGHT LBS	CENTER OF GRAVITY – % MAC													
	10	12	14	16	18	20	22	24	26	28	30	32	34	36
351,000	7.0	6.5	6.0	6.0	5.5	5.0	5.0	4.5	4.0	3.5	3.5	3.0	2.5	2.5
340,000	6.5	6.5	6.0	5.5	5.5	5.0	4.5	4.5	4.0	3.5	3.0	3.0	2.5	2.0
330,000	6.5	6.5	6.0	5.5	5.0	5.0	4.5	4.0	3.5	3.5	3.0	2.5	2.5	2.0
320,000	6.5	6.0	5.5	5.5	5.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	2.5	2.0
310,000	6.0	6.0	5.5	5.0	5.0	4.5	4.0	4.0	3.5	3.0	2.5	2.5	2.0	1.5
300,000	6.0	5.5	5.0	5.0	4.5	4.0	4.0	3.5	3.0	3.0	2.5	2.0	2.0	1.5
290,000	5.5	5.5	5.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	2.5	2.0	1.5	1.0
280,000	5.5	5.0	5.0	4.5	4.0	4.0	3.5	3.0	3.0	2.5	2.0	2.0	1.5	
270,000	5.0	5.0	4.5	4.0	4.0	3.5	3.5	3.0	2.5	2.5	2.0	1.5	1.5	
260,000	5.0	5.0	4.5	4.0	4.0	3.5	3.0	3.0	2.5	2.0	2.0	1.5	1.0	
250,000	5.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	2.5	2.0	1.5	1.5	1.0	
240,000	4.5	4.5	4.0	4.0	3.5	3.0	3.0	2.5	2.0	2.0	1.5	1.5	1.0	
230,000	4.5	4.5	4.0	3.5	3.5	3.0	2.5	2.5	2.0	2.0	1.5	1.0		
220,000	4.5	4.0	4.0	3.5	3.0	3.0	2.5	2.5	2.0	1.5	1.5	1.0		
210,000	4.0	4.0	3.5	3.5	3.0	3.0	2.5	2.0	2.0	1.5	1.5	1.0		
200,000	4.0	3.5	3.5	3.0	3.0	2.5	2.5	1.5	1.0	1.5	1.0			

End of Section

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DEFINITIONS AND ASSUMPTIONS

ACTUAL LANDING DISTANCE	The actual distance required to land starting at 50 feet above the runway (usually at the threshold) to a complete stop on the runway. This distance is based on a 1.3 V_S speed at 50 feet and assumes maximum braking and NO reverse thrust.
APPROACH CLIMB LIMIT WEIGHT	Approach Climb Limit Weight is defined in FAR 25.121 as the maximum weight at which a missed approach climb meets the FAR prescribed climb gradient (2.1% for a two engine aircraft). This gradient is determined with the critical engine inoperative, remaining engine at takeoff thrust, landing gear retracted, and approach flap setting (as defined in the FAA Approved Flight Manual). This weight takes into account an air conditioning pack ON and operated from engine bleed air.
F.A.R. LANDING FIELD LENGTH	This is the landing field length as defined in the Federal Air Regulations Part 121, and is the actual landing distance plus an additional safety margin of 67%. Dispatch is based on F.A.R. Landing Field Length at the destination airport.
GO-AROUND THRUST	Maximum thrust setting available for use during a missed approach.
LANDING CLIMB LIMIT WEIGHT	Landing Climb Limit Weight is defined in FAR 25.119 as the maximum weight at which the aircraft meets the FAR prescribed climb gradient (3.2%). This gradient is determined with all engines operating, landing gear extended, and landing flap setting.
V_S	Indicated stall speed for the aircraft weight and configuration. 1.3 V_S is 1.3 times the stall speed, or an increase of 30% above stall speed.

PATTERN AND APPROACH SPEEDS

KIAS NORMAL CONFIGURATION

GROSS WEIGHT - POUNDS	V _{Ref}	APPROACH - GEAR UP					LANDING - GEAR DOWN	
		SLATS RET.	SLATS EXTENDED				SLATS EXTENDED	
		FLAPS 0	FLAPS 1	FLAPS 5	FLAPS 15	FLAPS 20	FLAPS 25	FLAPS 30
		V _{ref} + 80	V _{ref} + 60	V _{ref} + 40	V _{ref} + 20	V _{ref} + 20		
350,000	157	237	217	197	177	177	164	157
340,000	153	233	213	193	173	173	161	153
330,000	150	230	210	190	170	170	159	150
325,000	147	227	207	187	167	167	158	147
320,000	146	226	206	186	166	166	157	146
310,000	144	224	204	184	164	164	154	144
300,000	141	221	201	181	161	161	152	141
290,000	139	219	199	179	159	159	149	139
280,000	136	216	196	176	156	156	146	136
270,000	134	214	194	174	154	154	144	134
260,000	131	211	191	171	151	151	141	131
250,000	129	209	189	169	149	149	138	129
240,000	126	206	186	166	146	146	135	126
230,000	123	203	183	163	143	143	132	123
220,000	121	201	181	161	141	141	129	121
210,000	118	198	178	158	138	138	126	118
200,000	115	195	175	155	135	135	123	115

STALL SPEEDS - V_s **KIAS**

GROSS WEIGHT - POUNDS	GEAR UP					GEAR DOWN	
	FLAPS 0 SLATS RET	FLAPS 1 SLATS EXT	FLAPS 5 SLATS EXT	FLAPS 15 SLATS EXT	FLAPS 20 SLATS EXT	FLAPS 25 SLATS EXT	FLAPS 30 SLATS EXT
325,000	173	143	134	131	128	123	120
320,000	172	142	133	130	127	122	119
310,000	169	139	130	128	125	121	117
300,000	165	137	128	126	123	119	115
290,000	162	134	126	123	120	117	113
280,000	159	131	123	121	118	115	110
270,000	155	129	121	118	115	113	108
260,000	152	126	118	116	113	111	106
250,000	148	123	115	113	110	108	104
240,000	145	120	112	110	108	106	102
230,000	142	117	110	108	105	104	99
220,000	138	114	107	105	102	102	97
210,000	134	111	104	102	100	99	95
200,000	131	108	102	100	97	97	93

F.A.R. DRY LANDING FIELD LENGTH**FEET****CF6-80A2****FLAPS 25**

AIRCRAFT WEIGHT - POUNDS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
350,000	7,650	7,840	8,060	8,270	8,510	8,750	9,000	9,260	9,520
340,000	7,310	7,500	7,710	7,920	8,120	8,360	8,600	8,820	9,100
330,000	7,000	7,190	7,370	7,550	7,770	7,980	8,200	8,420	8,670
320,000	6,700	6,870	7,050	7,210	7,410	7,600	7,820	8,020	8,260
310,000	6,380	6,530	6,710	6,860	7,060	7,240	7,430	7,640	7,860
300,000	6,090	6,240	6,400	6,550	6,720	6,900	7,070	7,250	7,480
290,000	5,810	5,950	6,090	6,230	6,400	6,560	6,740	6,900	7,110
280,000	5,560	5,700	5,830	5,980	6,120	6,270	6,440	6,610	6,780
270,000	5,400	5,530	5,660	5,800	5,940	6,100	6,250	6,410	6,570
260,000	5,230	5,360	5,490	5,620	5,760	5,910	6,060	6,210	6,370
250,000	5,070	5,190	5,320	5,400	5,580	5,730	5,870	6,010	6,170
240,000	4,910	5,030	5,140	5,260	5,410	5,520	5,680	5,810	5,970
230,000	4,750	4,860	4,970	5,100	5,230	5,350	5,490	5,620	5,770
220,000	4,580	4,690	4,800	4,910	5,050	5,180	5,300	5,430	5,570
210,000	4,420	4,520	4,630	4,750	4,870	4,980	5,110	5,230	5,370
200,000	4,260	4,350	4,400	4,560	4,690	4,780	4,900	5,020	5,150

NOTE:

Actual Landing Distance is:

- 60 percent of the F.A.R. Landing Field Lengths above.
- The distance to a complete stop from 50 feet above the runway threshold at V_{Ref} .
- Based on maximum manual braking, speed brakes extended and NO reverse thrust.

CORRECTIONS:

CONDITION	CORRECTION
Headwind	- 20 ft. per knot
Tailwind	+ 130 ft. per knot
Manual Spoilers	Refer to ODM Abnormal Section
Wet runway and/or Low Minima	increase distance by 15%

F.A.R. DRY LANDING FIELD LENGTH**FEET****CF6-80A2****FLAPS 30**

AIRCRAFT WEIGHT - POUNDS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
350,000	6,900	7,150	7,320	7,520	7,730	7,950	8,200	8,410	8,670
340,000	6,570	6,750	6,920	7,110	7,300	7,500	7,720	7,920	8,170
330,000	6,230	6,380	6,550	6,720	6,900	7,070	7,260	7,470	7,680
320,000	5,900	6,060	6,210	6,360	6,520	6,680	6,850	7,050	7,225
310,000	5,620	5,770	5,910	6,050	6,210	6,360	6,520	6,700	6,870
300,000	5,390	5,570	5,660	5,800	5,940	6,100	6,250	6,400	6,570
290,000	5,230	5,360	5,500	5,620	5,770	5,910	6,060	6,230	6,380
280,000	5,100	5,210	5,340	5,470	5,610	5,750	5,890	6,030	6,200
270,000	4,940	5,060	5,190	5,310	5,440	5,570	5,710	5,870	6,020
260,000	4,800	4,910	5,030	5,150	5,280	5,420	5,540	5,700	5,830
250,000	4,650	4,760	4,880	5,000	5,110	5,250	5,370	5,510	5,650
240,000	4,500	4,600	4,720	4,850	4,950	5,070	5,190	5,340	5,470
230,000	4,350	4,450	4,560	4,670	4,790	4,900	5,020	5,150	5,280
220,000	4,200	4,300	4,410	4,510	4,620	4,740	4,840	4,970	5,010
210,000	4,050	4,150	4,250	4,360	4,460	4,570	4,670	4,800	4,920
200,000	3,910	4,000	4,080	4,180	4,280	4,400	4,500	4,620	4,730

NOTE:

Actual Landing Distance is:

- 60 percent of the F.A.R. Landing Field Lengths above.
- The distance to a complete stop from 50 feet above the runway threshold at V_{Ref} .
- Based on maximum manual braking, speed brakes extended and NO reverse thrust.

CORRECTIONS:

CONDITION	CORRECTION
Headwind	- 20 ft. per knot
Tailwind	+ 130 ft. per knot
Manual Spoilers	Refer to ODM Abnormal Section
Wet runway and/or Low Minima	increase distance by 15%

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APPROACH AND LANDING CLIMB LIMITS

POUNDS

CF6-80A2
**APPROACH FLAPS 20
LANDING FLAPS 25 or 30**

OAT - °F	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
120	320,000	306,000	294,500	OUTSIDE ENVIRONMENTAL ENVELOPE					
115	330,000	316,500	304,000						
110	340,000	326,000	313,000	301,000	289,500	278,000			
105	349,000	335,000	321,500	309,000	297,000	285,000			
100	358,000	344,000	330,000	316,500	304,000	293,000	281,500	270,500	260,000
95	360,000	353,000	339,000	325,000	312,000	300,000	288,500	277,500	266,500
90	360,000	360,000	347,000	333,000	320,000	307,000	295,000	283,500	273,000
85	360,000	360,000	353,500	341,000	328,000	314,000	302,500	290,000	280,000
80	360,000	360,000	354,000	347,000	336,500	322,000	310,000	297,000	286,000
75	360,000	360,000	354,500	347,500	339,500	331,500	317,000	305,000	293,000
70	360,000	360,000	355,000	348,000	340,000	332,000	322,500	310,500	299,000
65	360,000	360,000	355,000	348,000	340,000	332,000	323,000	313,000	303,000
60	360,000	360,000	355,500	348,500	340,500	332,500	323,000	313,000	305,000
55	360,000	360,000	356,000	349,000	341,000	333,000	323,500	313,500	305,000
50 & below	360,000	360,000	356,500	349,500	341,000	333,000	324,000	314,000	305,500

NOTES:

1. AFM Maximum Structural Landing Weight should not be exceeded (unless overweight landing is deemed necessary in flight).
2. Reduce Gross Weight by 24,600 lbs. when operating in icing conditions during any part of the flight when the forecast landing temperature is below 50°F.
3. Apply the following Gross Weight Corrections (pounds) for applicable bleed configuration:

CONFIGURATION	CORRECTIONS - POUNDS	
	A/C PACKS OFF	A/C PACKS ON
Anti-Ice OFF	+2,500	0
Engine Anti-Ice ON	- 3,400	- 7,100
Engine & Wing Anti-Ice ON	- 16,100	- 17,200
APU ON	- 700	- 700

BASIS:

The limit weights shown are the more restrictive of:

- | | |
|--|--|
| <u>Approach</u> <ul style="list-style-type: none"> • One engine inoperative. • Flaps at approach setting. • Landing gear retracted. | <u>Landing</u> <ul style="list-style-type: none"> • All engines operating. • Flaps at landing setting. • Landing gear extended. |
|--|--|

OPERATIONAL LANDING DISTANCES

FEET

FLAPS 25

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).									
	DRY (6)						GOOD (5)			
	AB 1	AB 2	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	11,300	10,400	9,100	7,800	6,200	5,400	9,100	7,800	6,500	6,400
340,000	11,000	10,100	8,900	7,600	6,100	5,200	8,900	7,700	6,400	6,300
330,000	10,800	9,900	8,700	7,500	6,000	5,100	8,700	7,500	6,200	6,200
320,000	10,500	9,700	8,500	7,300	5,800	5,000	8,500	7,300	6,100	6,100
310,000	10,200	9,400	8,300	7,200	5,700	4,900	8,300	7,200	6,000	5,900
300,000	9,900	9,200	8,100	7,000	5,600	4,700	8,100	7,000	5,900	5,800
295,000	9,800	9,100	8,000	6,900	5,600	4,700	8,000	6,900	5,800	5,700
290,000	9,700	8,900	7,900	6,800	5,500	4,600	7,900	6,900	5,700	5,700
280,000	9,400	8,700	7,700	6,700	5,400	4,500	7,700	6,700	5,600	5,600
270,000	9,100	8,500	7,500	6,500	5,300	4,400	7,500	6,500	5,500	5,400
260,000	8,800	8,200	7,300	6,400	5,200	4,200	7,300	6,400	5,400	5,300
250,000	8,500	8,000	7,100	6,200	5,000	4,100	7,100	6,200	5,200	5,200
240,000	8,300	7,700	6,900	6,000	4,900	4,000	6,900	6,100	5,100	5,100
230,000	8,000	7,500	6,700	5,900	4,800	3,900	6,700	5,900	5,000	4,900
220,000	7,700	7,200	6,500	5,700	4,700	3,700	6,500	5,700	4,800	4,800

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)						GOOD (5)			
0	-600	-600	-500	-400	-300	-200	-500	-400	-300	-300
2,000	0	0	0	0	0	0	0	0	0	0
4,000	600	600	500	400	300	200	500	400	300	300
6,000	1,200	1,100	900	700	600	500	900	700	600	600
8,000	1,900	1,700	1,400	1,100	800	700	1,400	1,100	900	900

CORRECTIONS

	DRY (6)						GOOD (5)			
PER 1 KT HEADWIND	-50	-50	-50	-50	0	0	-50	-50	0	0
PER 1 KT TAILWIND	150	150	100	100	50	50	100	100	100	100
PER 5 KTS ADD'L SPD	350	400	450	350	250	200	450	350	250	200
PER 10°C ABOVE ISA	300	300	250	200	150	100	250	200	150	150
PER 10°C BELOW ISA	-300	-250	-250	-200	-150	-100	-250	-200	-150	-150
PER 1% UP SLOPE	-250	-150	0	0	0	-50	0	0	-50	-150
PER 1% DOWN SLOPE	200	100	0	0	0	100	0	0	100	150
1 REVERSER INOP	600	200	0	0	0	100	0	0	200	300
2 REVERSERS INOP	800	200	0	0	0	300	0	100	500	600
MANUAL SPOILERS	0	0	0	0	0	500	0	0	0	500

Note: Do not operate when Braking Action is Nil.

OPERATIONAL LANDING DISTANCES

FEET

FLAPS 25

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).							
	MEDIUM (3)				POOR (1)			
	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	9,600	8,900	8,800	8,800	11,600	11,500	11,500	11,500
340,000	9,400	8,700	8,600	8,600	11,300	11,200	11,200	11,200
330,000	9,200	8,500	8,400	8,400	11,000	11,000	11,000	11,000
320,000	9,000	8,300	8,200	8,200	10,700	10,700	10,700	10,700
310,000	8,800	8,100	8,000	8,000	10,500	10,400	10,400	10,400
300,000	8,600	7,900	7,800	7,800	10,200	10,100	10,100	10,100
295,000	8,500	7,800	7,700	7,700	10,100	10,000	10,000	10,000
290,000	8,400	7,700	7,600	7,600	9,900	9,800	9,800	9,800
280,000	8,200	7,500	7,400	7,400	9,600	9,600	9,600	9,600
270,000	8,000	7,300	7,200	7,200	9,400	9,300	9,300	9,300
260,000	7,800	7,100	7,100	7,100	9,100	9,000	9,000	9,000
250,000	7,600	6,900	6,900	6,900	8,800	8,700	8,700	8,700
240,000	7,400	6,700	6,700	6,700	8,500	8,500	8,500	8,500
230,000	7,100	6,500	6,500	6,500	8,300	8,200	8,200	8,200
220,000	6,900	6,300	6,300	6,300	8,000	7,900	7,900	7,900

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.



Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	MEDIUM (3)				POOR (1)			
0	-500	-500	-500	-500	-700	-700	-700	-700
2,000	0	0	0	0	0	0	0	0
4,000	500	500	500	500	700	700	700	700
6,000	1,000	900	900	900	1,300	1,300	1,300	1,300
8,000	1,500	1,400	1,400	1,400	2,000	2,000	2,000	2,000

CORRECTIONS	MEDIUM (3)				POOR (1)			
PER 1 KT HEADWIND	-50	-50	-50	-50	-50	-50	-50	-50
PER 1 KT TAILWIND	150	150	150	150	250	250	250	250
PER 5 KTS ADD'L SPD	450	350	250	250	400	300	300	300
PER 10°C ABOVE ISA	250	250	200	200	300	300	300	300
PER 10°C BELOW ISA	-250	-200	-200	-200	-300	-300	-300	-300
PER 1% UP SLOPE	-150	-200	-300	-300	-500	-550	-550	-550
PER 1% DOWN SLOPE	200	300	400	350	850	900	900	900
1 REVERSER INOP	400	700	800	800	1,500	1,700	1,700	1,700
2 REVERSERS INOP	1,200	1,700	1,900	1,900	4,200	4,300	4,300	4,300
MANUAL SPOILERS	0	0	0	500	0	0	0	500

Note: Do not operate when Braking Action is Nil.

OPERATIONAL LANDING DISTANCES

FEET

FLAPS 30

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).									
	DRY (6)						GOOD (5)			
	AB 1	AB 2	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	10,800	9,800	8,500	7,300	5,800	5,100	8,500	7,300	6,300	6,300
340,000	10,500	9,600	8,300	7,100	5,700	5,000	8,300	7,200	6,100	6,100
330,000	10,300	9,300	8,100	7,000	5,600	4,900	8,100	7,000	6,000	6,000
320,000	10,000	9,100	7,900	6,800	5,500	4,800	7,900	6,900	5,900	5,900
310,000	9,800	8,900	7,700	6,700	5,400	4,600	7,700	6,700	5,800	5,800
300,000	9,500	8,700	7,500	6,500	5,300	4,500	7,500	6,600	5,700	5,600
295,000	9,400	8,600	7,400	6,500	5,200	4,500	7,400	6,500	5,600	5,600
290,000	9,300	8,500	7,400	6,400	5,200	4,400	7,400	6,400	5,600	5,500
280,000	9,000	8,200	7,200	6,200	5,100	4,300	7,200	6,300	5,400	5,400
270,000	8,800	8,000	7,000	6,100	5,000	4,200	7,000	6,100	5,300	5,200
260,000	8,500	7,800	6,800	5,900	4,900	4,100	6,800	6,000	5,200	5,100
250,000	8,200	7,600	6,600	5,800	4,800	4,000	6,600	5,800	5,100	5,000
240,000	8,000	7,400	6,400	5,700	4,700	3,900	6,400	5,700	5,000	4,900
230,000	7,700	7,200	6,200	5,500	4,600	3,800	6,200	5,500	4,900	4,700
220,000	7,500	6,900	6,100	5,400	4,500	3,700	6,100	5,400	4,800	4,600

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)						GOOD (5)			
0	-600	-500	-400	-300	-300	-200	-400	-300	-300	-300
2,000	0	0	0	0	0	0	0	0	0	0
4,000	600	500	400	300	300	200	400	300	300	300
6,000	1,200	1,000	800	700	500	400	800	700	600	600
8,000	1,700	1,500	1,200	1,000	800	600	1,200	1,000	800	800

CORRECTIONS

	DRY (6)						GOOD (5)			
PER 1 KT HEADWIND	-50	-50	-50	-50	0	0	-50	-50	0	0
PER 1 KT TAILWIND	150	150	100	100	50	50	100	100	100	100
PER 5 KTS ADD'L SPD	350	400	400	350	250	150	400	350	250	200
PER 10°C ABOVE ISA	300	250	200	150	150	100	200	150	150	150
PER 10°C BELOW ISA	-300	-250	-200	-150	-150	-100	-200	-150	-150	-150
PER 1% UP SLOPE	-250	-100	0	0	0	-50	0	0	-100	-150
PER 1% DOWN SLOPE	150	0	0	0	0	100	0	0	150	150
1 REVERSER INOP	300	0	0	0	0	100	0	0	200	200
2 REVERSERS INOP	400	0	0	0	0	200	0	100	500	500
MANUAL SPOILERS	0	0	0	0	0	500	0	0	0	500

Note: Do not operate when Braking Action is Nil.

OPERATIONAL LANDING DISTANCES FEET

FLAPS 30

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).							
	MEDIUM (3)				POOR (1)			
	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	9,100	8,600	8,600	8,600	11,300	11,300	11,300	11,300
340,000	8,900	8,400	8,400	8,400	11,100	11,100	11,100	11,100
330,000	8,700	8,200	8,200	8,200	10,800	10,800	10,800	10,800
320,000	8,500	8,100	8,100	8,000	10,500	10,500	10,500	10,500
310,000	8,300	7,900	7,900	7,800	10,200	10,200	10,200	10,200
300,000	8,100	7,700	7,700	7,600	10,000	10,000	10,000	10,000
295,000	8,000	7,600	7,600	7,500	9,800	9,800	9,800	9,800
290,000	7,900	7,500	7,500	7,400	9,700	9,700	9,700	9,700
280,000	7,700	7,300	7,300	7,200	9,400	9,400	9,400	9,400
270,000	7,500	7,100	7,100	7,100	9,100	9,100	9,100	9,100
260,000	7,400	6,900	6,900	6,900	8,800	8,800	8,800	8,800
250,000	7,200	6,800	6,800	6,700	8,600	8,600	8,600	8,600
240,000	7,000	6,600	6,600	6,500	8,300	8,300	8,300	8,300
230,000	6,800	6,400	6,400	6,300	8,000	8,000	8,000	8,000
220,000	6,600	6,200	6,200	6,100	7,700	7,700	7,700	7,700

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.



Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	MEDIUM (3)				POOR (1)			
0	-500	-400	-400	-400	-600	-600	-600	-600
2,000	0	0	0	0	0	0	0	0
4,000	500	400	400	400	600	600	600	600
6,000	1,000	900	900	900	1,300	1,300	1,300	1,300
8,000	1,400	1,300	1,300	1,300	1,900	1,900	1,900	1,900

CORRECTIONS	MEDIUM (3)				POOR (1)			
PER 1 KT HEADWIND	-50	-50	-50	-50	-50	-50	-50	-50
PER 1 KT TAILWIND	150	150	150	150	250	250	250	250
PER 5 KTS ADD'L SPD	400	300	250	250	350	300	300	300
PER 10°C ABOVE ISA	250	200	200	200	300	300	300	300
PER 10°C BELOW ISA	-250	-200	-200	-200	-300	-300	-300	-300
PER 1% UP SLOPE	-150	-250	-300	-300	-550	-600	-600	-600
PER 1% DOWN SLOPE	250	400	400	400	950	950	950	950
1 REVERSER INOP	400	600	600	600	1,400	1,400	1,400	1,400
2 REVERSERS INOP	1,100	1,400	1,500	1,500	3,500	3,500	3,500	3,500
MANUAL SPOILERS	0	0	0	500	0	0	0	500

Note: Do not operate when Braking Action is Nil.

End of Section

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DEFINITIONS AND ASSUMPTIONS

GROSS LEVEL OFF ALTITUDE	Altitude at which the aircraft is expected to level off after the loss of one engine. No conservatism is built into this value. For use during flight, not for flight planning.
LONG RANGE CRUISE	The speed of the aircraft that will result in 99% of the maximum range of the aircraft in no wind conditions for a given weight and altitude.
MAXIMUM CONTINUOUS THRUST (MCT)	The maximum thrust level for which the engine is rated with no time constraint.
SPECIFIC AIR RANGE (SAR)	The gas mileage range an aircraft can fly per 1,000 lbs of fuel for a given weight, altitude, Mach number, and temperature. The SAR changes as the weight of the aircraft changes, all other parameters remaining constant. Fuel burn required for a given flight segment is the segment length divided by the average SAR for the leg.
STATIC AIR TEMPERATURE (SAT)	The static air temperature outside of the aircraft. Also referred to as the Outside Air Temperature or OAT.
TOTAL AIR TEMPERATURE (TAT)	The sum of both the ambient air temperature plus the total increase in temperature due to compression heating.

MEL RELATED PERFORMANCE ABBREVIATIONS DISPLAYED ON WDR

ASI	AWABS has automatically corrected the allowable weights and V1 speeds due to a completely inoperative anti-skid braking system.
BKI	AWABS has automatically corrected the allowable weights and V1 speeds due to an inoperative brake or one anti-skid channel inoperative.
GRD	AWABS has automatically corrected the allowable weights and V1 speeds due to gear down dispatch. Used when an MEL item requires delayed gear retraction or gear down flight.

INTENTIONALLY BLANK

THRUST SETTINGS – ALL ENGINES**TAKEOFF**% N₁**TO****CF6-80A2**

BASED ON FULL RATING
 NORMAL BLEED – PACKS ON, EEC ON, ANTI-ICE ON OR OFF

AIRPORT OAT		TAT (°C)	AIRPORT PRESSURE ALTITUDE (FT)					
°F	°C		-1,000	0	2,000	4,000	6,000	8,000
131	55	58	103.4	104.0	104.0	104.0	104.0	104.0
122	50	53	105.0	105.5	105.5	105.5	105.5	105.5
113	45	48	105.8	106.3	106.3	106.3	106.3	106.3
104	40	43	106.7	107.2	107.2	107.2	107.2	107.2
95	35	38	107.4	108.0	108.0	108.0	108.0	108.0
86	30	33	106.7	107.5	108.7	108.7	108.7	108.7
77	25	28	105.8	106.6	107.8	109.8	110.0	110.0
68	20	23	105.0	105.7	106.9	108.8	110.4	110.9
59	15	18	104.1	104.8	106.0	107.8	109.4	109.9
50	10	13	103.1	103.9	105.0	106.9	108.4	109.0
32	0	3	101.3	102.0	103.2	105.0	106.5	107.0
14	-10	-7	99.4	100.1	101.2	103.0	104.6	105.0
-4	-20	-17	97.6	98.2	99.3	101.1	102.6	103.0
-22	-30	-27	95.6	96.2	97.3	99.0	100.5	101.0
-40	-40	-37	93.6	94.2	95.3	97.0	98.4	98.9
-58	-50	-47	91.6	92.1	93.2	94.9	96.3	96.7

CORRECTIONS:

Bleed Configuration	PRESSURE ALTITUDE (1000 FT)					
	-1,000	0	2,000	4,000	6,000	8,000
Packs OFF	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3

THRUST SETTINGS – ALL ENGINES

MAXIMUM CLIMB

% N₁

CLB

CF6-80A2

NORMAL BLEED – PACKS ON, ANTI-ICE OFF

TAT °C	PRESSURE ALTITUDE (1000 FT) / SPEED (KIAS OR MACH)								
	0	5	10	15	20	25	30	35	40
	250	250	250	290	290	290	290	0.78	0.78
60	95.4	96.6	98.6	98.9	98.2	99.4	99.6	99.5	98.6
50	96.1	97.5	99.8	100.0	99.9	100.3	100.3	100.2	99.3
40	98.0	99.0	100.8	101.0	100.8	101.0	101.0	100.8	99.9
30	98.7	100.3	102.0	102.1	101.8	102.0	101.8	101.6	100.7
20	97.1	100.0	103.1	103.2	102.9	103.0	102.8	102.7	101.8
10	95.4	98.2	102.2	103.0	104.1	104.3	104.3	104.2	103.3
0	93.7	96.5	100.4	101.2	103.8	106.4	106.5	106.4	105.5
-10	91.9	94.7	98.5	99.3	101.8	104.7	107.4	109.1	108.2
-20	90.2	92.9	96.6	97.4	99.8	102.7	105.3	108.8	109.6
-30	88.4	91.0	94.7	95.5	97.9	100.6	103.2	106.7	107.5
-40	86.5	89.1	92.7	93.5	95.6	98.5	101.1	104.5	105.3
-50	84.7	87.2	90.7	91.5	93.8	96.4	98.9	102.2	103.0

CORRECTIONS:

Bleed Configuration	PRESSURE ALTITUDE (1000 FT)								
	0	5	10	15	20	25	30	35	40
Packs OFF	+0.3	+0.3	+0.4	+0.5	+0.5	+0.6	+0.0	+0.7	+0.9
Engine Anti-Ice ON	-0.6	-0.6	-0.6	-0.8	-0.9	-1.0	-1.2	-1.3	-1.8
Engine & Wing Anti-Ice ON	-0.9	-1.0	-1.0	-1.3	-1.4	-1.6	-1.8	-2.0	-2.6

THRUST SETTINGS – ALL ENGINES

MAXIMUM CRUISE

% N₁

CRZ

CF6-80A2

TAT °C	PRESSURE ALTITUDE (1000 FT)									
	10	15	20	25	30	35	37	39	41	43
45	94.3									
40	95.1									
35	95.8	95.9								
30	96.6	96.7								
25	97.2	97.3	97.6	97.6						
20	96.4	98.0	98.3	98.4	98.3					
15	95.6	97.2	99.1	99.2	99.3					
10	94.8	96.3	98.9	100.0	100.2					
5	94.0	95.5	98.0	100.9	101.0	101.2	101.0	100.6	100.2	99.7
0	93.2	94.6	97.1	100.0	102.3	102.5	102.2	101.9	101.5	100.9
-5	92.3	93.8	96.2	99.1	103.4	103.6	103.4	103.0	102.5	102.0
-10	91.5	92.9	95.3	98.2	102.4	105.0	104.7	104.3	103.9	103.4
-15	90.6	92.0	94.4	97.2	101.5	106.4	106.2	105.8	105.3	104.8
-20	89.8	91.2	93.5	96.3	100.5	105.4	106.2	105.8	105.3	104.8
-25		90.3	92.6	95.4	99.5	104.3	105.2	104.7	104.3	103.7
-30		89.4	91.7	94.4	98.5	103.3	104.1	103.7	103.2	102.7
-35			90.7	93.4	97.5	102.2	103.0	102.6	102.2	101.7
-40			89.8	92.5	96.5	101.2	102.0	101.6	101.1	100.6
-45					95.4	100.1	100.9	100.5	100.0	99.5
-50						99.0	99.8	99.4	98.9	98.5
-55						97.9	98.7	98.3	97.8	97.4
-60						96.8	97.5	97.2	96.7	96.3

Bleed Adjustments

Bleed Configuration	PRESSURE ALTITUDE (1000 FT)									
	10	15	20	25	30	35	37	39	41	43
Engine Anti-Ice ON	-1.2	-0.7	-0.8	-0.8	-0.9	-1.1	-1.1	-1.2	-1.2	-1.2
Engine & Wing Anti-Ice ON	-1.8	-1.2	-1.3	-1.3	-1.5	-1.7	-1.7	-1.8	-1.8	-1.8

THRUST SETTINGS – ALL ENGINES

GO AROUND

% N₁

CF6-80A2

BASED ON FULL INFLIGHT TAKEOFF RATING
PACKS ON, EEC ON, ENGINE A/I ON OR OFF, WING A/I OFF

AIRPORT OAT		TAT °C	AIRPORT PRESSURE ALTITUDE (FT)					
°F	°C		-1,000	0	2,000	4,000	6,000	8,000
131	55	58	103.0	103.6	103.6	103.6	103.6	103.5
122	50	53	104.6	105.1	105.1	105.1	105.1	105.0
113	45	48	105.4	105.9	105.9	105.9	105.9	105.8
104	40	43	106.3	106.8	106.8	106.8	106.8	106.7
95	35	38	107.0	107.6	107.6	107.6	107.6	107.5
86	30	33	106.3	107.1	108.3	108.3	108.3	108.2
77	25	28	105.4	106.2	107.4	109.4	109.6	109.5
68	20	23	104.6	105.3	106.5	108.4	110.0	110.4
59	15	18	103.8	104.5	105.7	107.5	109.1	110.1
50	10	13	102.8	103.6	104.7	106.6	108.1	109.2
32	0	3	101.0	101.7	102.9	104.7	106.2	107.2
14	-10	-7	99.1	99.8	100.9	102.7	104.3	105.2
-4	-20	-17	97.3	97.9	99.0	100.8	102.3	103.2
-22	-30	-27	95.3	95.9	97.0	98.7	100.2	101.2
-40	-40	-37	93.3	93.9	95.0	96.7	98.1	99.1
-58	-50	-47	91.3	91.8	92.9	94.6	96.0	96.9

CORRECTIONS:

Bleed Configuration	PRESSURE ALTITUDE (1000 FT)					
	-1,000	0	2,000	4,000	6,000	8,000
Packs OFF	+0.3	+0.3	+0.3	+0.4	+0.5	+0.5
Wing Anti-Ice ON – Engine Inop	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3

ONE ENGINE INOPERATIVE MAXIMUM CONTINUOUS THRUST

%N₁

CF6-80A2

ONE ENGINE INOPERATIVE
BASED ON 300 KIAS / 0.80 MACH SPEED SCHEDULE
NORMAL BLEED - PACKS ON, ANTI-ICE OFF

MCT

TAT - °C	PRESSURE ALTITUDE - FEET									
	0	5,000	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000
40	102.5	102.5	104.8	106.4	104.2	98.9	100.9	100.7	99.6	98.3
35	102.7	103.1	105.4	106.8	104.7	99.8	101.4	101.1	100.0	98.9
30	101.9	104.8	106.1	107.6	105.7	100.7	101.7	101.5	100.4	99.2
25	101.0	102.9	106.5	109.7	106.7	102.0	102.3	102.1	101.1	99.8
20	100.2	102.0	105.7	109.8	107.8	103.3	102.8	102.7	101.6	100.5
15	99.4	101.1	104.8	109.0	109.5	105.1	103.5	103.3	102.3	101.2
10	98.5	100.2	103.8	108.1	110.5	106.7	104.5	104.2	103.2	102.1
5	97.6	99.4	103.0	107.1	109.6	107.5	105.3	105.1	104.1	102.9
0	96.7	98.5	102.1	106.1	108.6	106.5	106.5	106.3	105.2	104.2
-5	95.8	97.6	101.1	105.1	107.6	105.5	107.8	107.6	106.5	105.5
-10	94.9	96.6	100.2	104.1	106.5	104.5	106.7	108.8	107.8	106.9
-12	94.5	96.2	99.8	103.7	106.1	104.1	106.2	109.3	108.3	107.4
-14	91.2	95.8	99.4	103.3	105.7	103.7	105.7	109.8	108.7	107.8
-16	93.8	95.4	99.1	102.9	105.3	103.4	105.3	110.2	109.2	108.2
-18	93.5	95.1	98.7	102.5	104.9	102.9	104.9	109.7	109.8	108.5
-20	93.1	94.8	98.3	102.1	104.5	102.5	104.6	109.2	109.3	108.3
-22	92.7	94.4	97.9	101.7	104.1	102.1	104.2	108.8	108.9	107.8
-24	92.3	94.0	97.5	101.3	103.6	101.7	103.7	108.4	108.5	107.3
-26	92.0	93.6	97.1	100.9	103.2	101.3	103.3	108.0	108.1	106.9
-28	91.6	93.2	96.7	100.5	102.7	100.9	102.9	107.6	107.7	106.5
-30	91.2	92.9	96.3	100.1	102.3	100.5	102.5	107.2	107.2	106.1
-32	90.8	92.5	95.9	99.7	101.9	100.1	102.1	106.7	106.7	105.6
-34	90.5	92.1	95.5	99.3	101.5	99.6	101.7	106.2	106.2	105.2
-36		91.7	95.1	98.8	101.0	99.2	101.3	105.7	105.8	104.5
-38		91.3	94.7	98.4	100.6	98.8	100.8	105.2	105.3	104.0
-40		90.9	94.3	98.0	100.2	98.4	100.3	104.7	104.8	103.8
-42			93.9	97.6	99.8	98.0	99.9	104.3	104.4	103.4
-44			93.4	97.2	99.4	97.5	99.5	103.8	103.9	102.9
-46			93.0	96.7	98.9	97.1	99.1	103.4	103.3	102.5
-48			92.6	96.3	98.5	96.7	98.7	103.0	103.0	102.0
-50			92.2	95.9	98.1	96.3	98.2	102.5	102.6	101.6

CORRECTIONS:

1 Pack OFF	+ 0.3	+ 0.4	+ 0.5	+ 0.5	+ 0.6	+ 0.6	+ 0.7	+ 0.8	+ 1.0	+ 1.2
2 Packs OFF	- 0.3	- 0.4	- 0.5	- 0.5	- 0.6	- 0.6	- 0.7	- 0.8	- 1.0	- 1.2
Eng A/I ON*	- 0.6	- 0.6	- 0.7	- 0.8	- 0.9	- 1.0	- 1.1	- 1.2	- 1.6	- 2.1
Wing A/I ON (1 or 2 Packs ON)	- 0.6	- 0.7	- 0.8	- 0.9	- 1.0	- 1.1	- 1.1	- 1.3	- 1.4	- 1.5
Wing A/I ON (2 Packs OFF)	- 0.9	- 1.1	- 1.3	- 1.4	- 1.6	- 1.7	- 1.9	- 2.1	- 2.4	- 2.5

* NO ENGINE ANTI-ICE CORRECTION WHEN OAT IS BELOW 10°C AND PRESS. ALT. IS LESS THAN 8,000 FEET.

ONE ENGINE INOPERATIVE DRIFTDOWN PROCEDURES

IN THE EVENT OF AN ENGINE FAILURE OR SHUTDOWN DURING CRUISE:

1. Immediately set Maximum Continuous Thrust (MCT) from previous page.
2. Allow aircraft to decelerate in level flight to driftdown speed prior to initiating descent.
 - Aircraft will level off at or above altitudes shown in DRIFTDOWN GROSS LEVEL-OFF ALTITUDE chart.
 - Cross-check FMS engine-out level-off altitude if so equipped. Otherwise, cross-check with level-off altitude in ODM.
3. If driftdown terrain clearance is critical, consult Flight Plan Remarks to determine:
 - Recommended en route alternate airports, if required.
 - ISA temperature deviation at 18,000 feet.
4. If terrain clearance is a factor, select a suitable alternate airport as follows:
 - Terrain clearance is assured for flight to any flight plan alternate airport listed.
 - Comply with Unrestricted/Restricted Critical Terrain Procedures as described in Airway Manual – Section 6.
 - Use flight plan recommended en route alternate airport, or:
 - Determine aircraft position on appropriate Jeppesen Low Level or High/Low Level enroute chart and locations of other suitable alternates.
 - Check terrain clearance for flight via MEA / MOCA on airway or Grid MORA for a non-flight-plan suitable enroute alternate.
 - Maintain MCT / driftdown speed after level-off and allow aircraft to climb until at/above MEA / MOCA on airway or Grid MORA.
 - Maintain airway MEA / MOCA until established on the arrival to selected alternate airport.
5. Proceed to selected nearest suitable alternate.
6. Except as specified in Step 4, maintain Maximum Continuous Thrust (MCT) and allow aircraft to accelerate to engine-out Long Range Cruise speed at level-off altitude.

**ONE ENGINE INOPERATIVE
DRIFTDOWN SPEED SCHEDULE
KIAS**

GROSS WEIGHT - POUNDS	PRESSURE ALTITUDE - FEET			
	10,000	20,000	30,000	40,000
360,000	253	257	262	271
350,000	250	253	258	267
340,000	246	249	254	262
330,000	242	245	250	258
320,000	239	241	246	253
310,000	235	238	242	249
300,000	231	233	238	244
290,000	227	229	233	240
280,000	223	225	229	235
270,000	219	221	224	231
260,000	215	217	220	226
250,000	211	212	215	221
240,000	207	208	211	216
230,000	202	204	206	211
220,000	197	199	202	206
210,000	193	194	197	201

ONE ENGINE INOPERATIVE

DRIFTDOWN SPEED AND GROSS LEVEL OFF ALTITUDE

FEET

ENGINE ANTI-ICE OFF

GROSS WEIGHT – POUNDS		APPROX GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	OPTIMUM DRIFTDOWN SPEED - KIAS	ISA + 10°C & COLDER	ISA + 15°C	ISA + 20°C
360,000	348,000	255	18,800	18,600	17,400
340,000	329,000	248	20,300	20,100	19,000
320,000	310,000	241	21,700	21,500	20,500
300,000	290,000	234	23,100	23,000	21,900
280,000	271,000	226	24,600	24,600	23,500
260,000	251,000	218	26,500	26,300	25,200
240,000	232,000	209	28,400	28,200	27,200
220,000	213,000	201	30,400	30,200	29,400

ENGINE ANTI-ICE ON

GROSS WEIGHT – POUNDS		APPROX GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	OPTIMUM DRIFTDOWN SPEED - KIAS	ISA + 10°C & COLDER	ISA + 15°C	ISA + 20°C
360,000	347,000	254	17,600	17,600	16,400
340,000	328,000	247	19,200	19,100	18,200
320,000	310,000	240	20,700	20,600	19,700
300,000	290,000	233	22,300	22,300	21,300
280,000	271,000	225	23,900	23,800	22,900
260,000	251,000	217	25,800	25,700	24,700
240,000	233,000	209	27,700	27,600	26,800
220,000	213,000	201	29,900	29,600	28,900

ENGINE & WING ANTI-ICE ON

GROSS WEIGHT – POUNDS		APPROX GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	OPTIMUM DRIFTDOWN SPEED - KIAS	ISA + 10°C & COLDER	ISA + 15°C	ISA + 20°C
360,000	347,000	254	17,000	16,900	15,600
340,000	327,000	247	18,600	18,500	17,500
320,000	310,000	240	20,200	20,100	19,000
300,000	290,000	233	21,700	21,600	20,600
280,000	271,000	225	23,500	23,400	22,400
260,000	251,000	217	25,300	25,200	24,000
240,000	232,000	209	27,300	27,200	26,100
220,000	212,000	200	29,400	29,200	28,400

BASIS:

- APU operating
- Maximum Continuous Thrust Limits
- 100 ft/min residual rate of climb
- 35,000 ft initial altitude

ONE ENGINE INOPERATIVE

LONG RANGE CRUISE ALTITUDE CAPABILITY

FEET

GROSS WEIGHT - POUNDS	PRESSURE ALTITUDE - FEET		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
360,000	14,700	14,500	11,600
350,000	15,900	15,800	13,400
340,000	17,000	16,900	14,700
330,000	18,000	17,800	16,000
320,000	18,900	18,700	17,200
310,000	19,900	19,600	18,200
300,000	20,600	20,400	19,100
290,000	21,400	21,200	20,000
280,000	22,200	22,000	20,800
270,000	22,900	22,800	21,600
260,000	23,800	23,700	22,400
250,000	24,600	24,500	23,300
240,000	25,600	25,500	24,200
230,000	26,800	26,500	25,200
220,000	28,000	27,600	26,300

CORRECTIONS:

CONFIGURATION	ALT. CORRECTION – FEET
Packs OFF	+ 200
Engine Anti-Ice ON	- 1,600
Engine and Wing Anti-Ice ON	- 3,600
APU OFF	+ 200

BASIS:

- Max continuous thrust.
- Long range cruise speed.
- 100 ft/min residual rate of climb

ONE ENGINE INOPERATIVE LONG RANGE CRUISE

FL ISA		GROSS WEIGHT - POUNDS							
		350,000	340,000	330,000	320,000	310,000	300,000	290,000	280,000
290 - 43	SAR N ₁ FF MN IAS TAS								
280 - 41	SAR N ₁ FF MN IAS TAS								
270 - 39	SAR N ₁ FF MN IAS TAS								
260 - 37	SAR N ₁ FF MN IAS TAS								
250 - 35	SAR N ₁ FF MN IAS TAS								
240 - 33	SAR N ₁ FF MN IAS TAS								

DEFINITIONS:

FL: Flight level / altitude (feet).

ISA: Standard Day temperature in °C.

SAR: Specific Air Range (nm per 1,000 lbs of fuel).

N₁: Target N₁ setting (percent).

FF: Fuel Flow (lb per hr).

MN: Mach number.

IAS: Indicated airspeed in knots.

TAS: True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- SAR decreases 0.2% for every +10°C and increases 0.2% for every -10°C difference from ISA.
- N₁ decreases 1% for every +5°C and increases 1% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE LONG RANGE CRUISE

FL ISA		GROSS WEIGHT - POUNDS							
		270,000	260,000	250,000	240,000	230,000	220,000	210,000	200,000
290 - 43	SAR								45.0
	N ₁								105.6
	FF								7,796
	MN								0.592
	IAS								225
	TAS								351
280 - 41	SAR							42.8	45.5
	N ₁							106.4	102.5
	FF							8,246	7,607
	MN							0.593	0.582
	IAS							230	226
	TAS							353	346
270 - 39	SAR						40.8	43.3	45.8
	N ₁						107.0	103.2	100.4
	FF						8,690	8,044	7,461
	MN						0.594	0.583	0.573
	IAS						235	231	227
	TAS						354	348	342
260 - 37	SAR						41.3	43.6	46.0
	N ₁						103.7	101.0	98.9
	FF						8,477	7,886	7,346
	MN						0.584	0.574	0.564
	IAS						236	232	228
	TAS						350	344	338
250 - 35	SAR					39.5	41.6	43.8	46.1
	N ₁					104.2	101.6	99.5	97.3
	FF					8,903	8,309	7,763	7,236
	MN					0.584	0.574	0.565	0.554
	IAS					241	237	233	228
	TAS					352	346	340	333
240 - 33	SAR				37.9	39.8	41.8	43.9	46.1
	N ₁				104.6	102.0	100.0	97.9	95.9
	FF				9,322	8,728	8,180	7,648	7,125
	MN				0.584	0.575	0.565	0.555	0.544
	IAS				246	242	238	234	229
	TAS				353	347	342	336	329

DEFINITIONS:

FL: Flight level / altitude (feet).
ISA: Standard Day temperature in °C.
SAR: Specific Air Range (nm per 1,000 lbs of fuel).
N₁: Target N₁ setting (percent).

FF: Fuel Flow (lb per hr).
MN: Mach number.
IAS: Indicated airspeed in knots.
TAS: True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- SAR decreases 0.2% for every +10°C and increases 0.2% for every -10°C difference from ISA.
- N₁ decreases 1% for every +5°C and increases 1% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE

LONG RANGE CRUISE

FL ISA		GROSS WEIGHT - POUNDS							
		350,000	340,000	330,000	320,000	310,000	300,000	290,000	280,000
230 - 31	SAR N ₁ FF MN IAS TAS								
220 - 29	SAR N ₁ FF MN IAS TAS								
210 - 27	SAR N ₁ FF MN IAS TAS								32.4 108.0 11,143 0.589 265 361
200 - 25	SAR N ₁ FF MN IAS TAS							31.3 107.9 11,528 0.588 270 361	32.6 105.3 10,938 0.580 266 356
190 - 23	SAR N ₁ FF MN IAS TAS						30.4 107.6 11,906 0.586 274 362	31.5 105.3 11,328 0.579 271 357	32.7 103.4 10,770 0.571 267 352
180 - 21	SAR N ₁ FF MN IAS TAS					29.5 107.3 12,279 0.584 279 362	30.5 105.2 11,716 0.577 275 357	31.6 103.5 11,169 0.570 272 353	32.8 101.9 10,637 0.563 268 348

DEFINITIONS:**FL:** Flight level / altitude (feet).**ISA:** Standard Day temperature in °C.**SAR:** Specific Air Range (nm per 1,000 lbs of fuel).**N₁:** Target N₁ setting (percent).**FF:** Fuel Flow (lb per hr).**MN:** Mach number.**IAS:** Indicated airspeed in knots.**TAS:** True airspeed in knots.**TEMPERATURE TRADE FACTORS:**

- SAR decreases 0.2% for every +10°C and increases 0.2% for every -10°C difference from ISA.
- N₁ decreases 1% for every +5°C and increases 1% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE LONG RANGE CRUISE

FL ISA		GROSS WEIGHT - POUNDS							
		270,000	260,000	250,000	240,000	230,000	220,000	210,000	200,000
230 - 31	SAR			36.4	38.1	39.9	41.9	43.9	46.2
	N ₁			104.9	102.4	100.5	98.5	96.5	94.5
	FF			9,735	9,145	8,597	8,061	7,532	7,003
	MN			0.583	0.575	0.566	0.556	0.545	0.533
	IAS			251	247	243	239	234	229
	TAS			354	349	343	337	331	324
220 - 29	SAR		35.0	36.6	38.2	40.0	41.9	44.0	46.0
	N ₁		105.1	102.7	100.9	99.0	97.0	95.1	93.3
	FF		10,143	9,557	9,012	8,473	7,938	7,406	6,928
	MN		0.583	0.574	0.566	0.556	0.546	0.535	0.523
	IAS		256	252	249	244	240	234	229
	TAS		355	350	345	339	333	326	319
210 - 27	SAR	33.7	35.2	36.7	38.3	40.1	42.0	43.9	45.5
	N ₁	105.2	103.0	101.3	99.4	97.5	95.7	93.9	92.4
	FF	10,544	9,966	9,424	8,882	8,341	7,806	7,312	6,924
	MN	0.582	0.573	0.565	0.556	0.546	0.536	0.525	0.515
	IAS	261	257	254	249	245	240	235	230
	TAS	356	351	346	340	334	328	321	315
200 - 25	SAR	33.9	35.3	36.8	38.4	40.2	41.9	43.4	45.0
	N ₁	103.2	101.5	99.7	97.9	96.1	94.4	93.0	91.6
	FF	10,370	9,832	9,288	8,742	8,204	7,698	7,302	6,937
	MN	0.573	0.565	0.556	0.547	0.536	0.525	0.516	0.508
	IAS	262	258	254	250	245	240	236	232
	TAS	352	347	342	336	329	323	317	312
190 - 23	SAR	34.0	35.4	36.9	38.5	40.1	41.5	42.9	44.4
	N ₁	101.8	100	98.3	96.6	94.9	93.5	92.2	90.7
	FF	10,236	9,690	9,142	8,600	8,084	7,683	7,320	6,921
	MN	0.564	0.555	0.546	0.537	0.526	0.517	0.509	0.499
	IAS	263	259	255	250	245	241	237	232
	TAS	348	343	337	331	324	319	314	308
180 - 21	SAR	34.0	35.4	36.9	38.5	39.8	41.0	42.4	44.0
	N ₁	100.2	98.6	96.9	95.3	93.9	92.7	91.3	89.7
	FF	10,089	9,540	8,994	8,473	8,066	7,703	7,306	6,893
	MN	0.555	0.546	0.536	0.526	0.518	0.510	0.500	0.489
	IAS	264	260	255	250	246	242	237	232
	TAS	343	338	332	326	321	316	310	303

DEFINITIONS:

FL: Flight level / altitude (feet).	FF: Fuel Flow (lb per hr).
ISA: Standard Day temperature in °C.	MN: Mach number.
SAR: Specific Air Range (nm per 1,000 lbs of fuel).	IAS: Indicated airspeed in knots.
N₁: Target N ₁ setting (percent).	TAS: True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- SAR decreases 0.2% for every +10°C and increases 0.2% for every -10°C difference from ISA.
- N₁ decreases 1% for every +5°C and increases 1% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE

LONG RANGE CRUISE

FL ISA		GROSS WEIGHT - POUNDS							
		350,000	340,000	330,000	320,000	310,000	300,000	290,000	280,000
170 - 19	SAR				28.6	29.6	30.6	31.6	32.8
	N ₁				107.1	105.1	103.6	102.1	100.4
	FF				12,652	12,102	11,563	11,033	10,484
	MN				0.582	0.575	0.569	0.561	0.554
	IAS				283	280	276	273	269
160 - 17	TAS				362	358	353	349	344
	SAR			27.8	28.7	29.6	30.6	31.7	32.9
	N ₁			106.9	105.1	103.6	102.1	100.5	99.0
	FF			13,024	12,487	11,954	11,422	10,875	10,325
	MN			0.580	0.574	0.567	0.560	0.552	0.544
150 - 15	IAS			288	284	281	277	273	269
	TAS			362	358	354	349	345	339
	SAR		27.0	27.8	28.7	29.6	30.6	31.7	33.0
	N ₁		106.7	105.1	103.6	102.2	100.6	99.2	97.7
	FF		13,395	12,866	12,340	11,807	11,261	10,708	10,151
140 - 13	MN		0.578	0.572	0.565	0.558	0.551	0.543	0.534
	IAS		292	289	285	282	278	274	269
	TAS		362	358	354	350	345	340	335
	SAR		27.0	27.8	28.7	29.7	30.7	31.8	32.9
	N ₁		105.0	103.6	102.1	100.7	99.3	97.8	96.5
130 - 11	FF		13,239	12,721	12,185	11,639	11,085	10,526	10,024
	MN		0.569	0.563	0.556	0.549	0.541	0.533	0.525
	IAS		293	290	286	282	278	274	270
	TAS		358	354	350	345	340	335	330
	SAR	26.3	27.0	27.9	28.7	29.7	30.8	31.7	32.6
120 - 9	N ₁	104.9	103.5	102.1	100.7	99.4	97.9	96.7	95.6
	FF	13,608	13,094	12,558	12,012	11,457	10,896	10,415	10,009
	MN	0.567	0.561	0.554	0.547	0.539	0.531	0.524	0.517
	IAS	298	294	291	287	283	278	274	271
	TAS	358	354	350	345	341	335	330	326
120 - 9	SAR	26.3	27.1	27.9	28.8	29.8	30.6	31.4	32.2
	N ₁	103.4	102.0	100.7	99.4	98.0	96.9	95.8	94.8
	FF	13,463	12,926	12,378	11,823	11,263	10,807	10,405	10,037
	MN	0.559	0.552	0.545	0.538	0.530	0.522	0.516	0.510
	IAS	299	295	291	287	283	279	275	272
120 - 9	TAS	354	350	345	341	336	331	327	323

DEFINITIONS:

FL: Flight level / altitude (feet).

ISA: Standard Day temperature in °C.

SAR: Specific Air Range (nm per 1,000 lbs of fuel).

N₁: Target N₁ setting (percent).

FF: Fuel Flow (lb per hr).

MN: Mach number.

IAS: Indicated airspeed in knots.

TAS: True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- SAR decreases 0.2% for every +10°C and increases 0.2% for every -10°C difference from ISA.
- N₁ decreases 1% for every +5°C and increases 1% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE LONG RANGE CRUISE

FL ISA		GROSS WEIGHT - POUNDS							
		270,000	260,000	250,000	240,000	230,000	220,000	210,000	200,000
170 - 19	SAR	34.1	35.5	36.9	38.1	39.3	40.5	41.9	43.4
	N ₁	98.8	97.2	95.6	94.3	93.1	91.8	90.3	88.7
	FF	9,934	9,384	8,860	8,450	8,084	7,691	7,278	6,877
	MN	0.545	0.536	0.526	0.518	0.511	0.501	0.491	0.480
	IAS	264	260	255	251	247	243	238	232
	TAS	339	333	327	322	317	312	305	299
160 - 17	SAR	34.2	35.5	36.6	37.7	38.8	40.1	41.5	42.9
	N ₁	97.5	96.0	94.7	93.5	92.3	90.9	89.3	87.7
	FF	9,770	9,247	8,837	8,469	8,077	7,664	7,257	6,859
	MN	0.535	0.526	0.518	0.511	0.502	0.492	0.482	0.472
	IAS	265	260	256	252	248	243	238	232
	TAS	334	328	323	319	313	307	301	294
150 - 15	SAR	34.2	35.2	36.2	37.2	38.4	39.6	41.0	42.4
	N ₁	96.2	95.0	93.9	92.7	91.3	89.8	88.3	86.8
	FF	9,635	9,225	8,856	8,464	8,050	7,639	7,240	6,844
	MN	0.525	0.518	0.511	0.503	0.493	0.483	0.473	0.463
	IAS	265	261	257	253	248	243	238	233
	TAS	329	324	320	315	309	303	297	290
140 - 13	SAR	33.8	34.7	35.7	36.8	38.0	39.2	40.5	41.8
	N ₁	95.3	94.2	93.1	91.8	90.3	88.9	87.4	86.0
	FF	9,616	9,247	8,852	8,436	8,022	7,622	7,219	6,865
	MN	0.517	0.511	0.503	0.494	0.484	0.475	0.465	0.456
	IAS	266	262	258	253	248	243	238	234
	TAS	325	321	316	311	305	299	292	287
130 - 11	SAR	33.4	34.3	35.3	36.4	37.5	38.7	39.9	41.1
	N ₁	94.5	93.4	92.2	90.8	89.3	87.9	86.6	85.4
	FF	9,640	9,240	8,823	8,406	8,004	7,596	7,234	6,910
	MN	0.511	0.503	0.494	0.485	0.476	0.466	0.457	0.450
	IAS	267	263	258	254	249	243	239	235
	TAS	322	317	312	306	300	294	289	284
120 - 9	SAR	33.1	34.0	35.0	36.0	37.1	38.2	39.3	40.5
	N ₁	93.7	92.5	91.2	89.8	88.4	87.1	85.9	84.7
	FF	9,630	9,210	8,791	8,388	7,978	7,607	7,276	6,971
	MN	0.502	0.494	0.485	0.476	0.467	0.459	0.452	0.445
	IAS	268	263	259	254	249	244	240	237
	TAS	318	313	307	302	296	291	286	282

DEFINITIONS:

FL: Flight level / altitude (feet).	FF: Fuel Flow (lb per hr).
ISA: Standard Day temperature in °C.	MN: Mach number.
SAR: Specific Air Range (nm per 1,000 lbs of fuel).	IAS: Indicated airspeed in knots.
N₁: Target N ₁ setting (percent).	TAS: True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- SAR decreases 0.2% for every +10°C and increases 0.2% for every -10°C difference from ISA.
- N₁ decreases 1% for every +5°C and increases 1% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE

LONG RANGE CRUISE

FL ISA		GROSS WEIGHT - POUNDS							
		350,000	340,000	330,000	320,000	310,000	300,000	290,000	280,000
110 - 7	SAR	26.3	27.1	28.0	28.8	29.6	30.3	31.1	31.8
	N ₁	101.9	100.7	99.4	98.1	97	96.0	95.0	94.0
	FF	13290	12741	12184	11643	11201	10,803	10,431	10,020
	MN	0.550	0.543	0.536	0.528	0.521	0.515	0.509	0.502
	IAS	299	295	291	287	283	280	277	273
	TAS	350	345	341	336	331	328	324	319

DEFINITIONS:

FL:	Flight level / altitude (feet).	FF:	Fuel Flow (lb per hr).
ISA:	Standard Day temperature in °C.	MN:	Mach number.
SAR:	Specific Air Range (nm per 1,000 lbs of fuel).	IAS:	Indicated airspeed in knots.
N₁:	Target N ₁ setting (percent).	TAS:	True airspeed in knots.

TEMPERATURE TRADE FACTORS:

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- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE LONG RANGE CRUISE

FL ISA		GROSS WEIGHT - POUNDS							
		270,000	260,000	250,000	240,000	230,000	220,000	210,000	200,000
110 - 7	SAR	32.7	33.6	34.6	35.6	36.6	37.6	38.7	39.8
	N ₁	92.8	91.5	90.2	88.8	87.5	86.4	85.2	84.0
	FF	9,598	9,177	8,772	8,361	7,984	7,646	7,339	7,034
	MN	0.494	0.485	0.477	0.468	0.460	0.453	0.446	0.440
	IAS	268	264	259	254	249	245	242	239
	TAS	314	309	303	297	292	288	284	280

DEFINITIONS:

FL:	Flight level / altitude (feet).	FF:	Fuel Flow (lb per hr).
ISA:	Standard Day temperature in °C.	MN:	Mach number.
SAR:	Specific Air Range (nm per 1,000 lbs of fuel).	IAS:	Indicated airspeed in knots.
N₁:	Target N ₁ setting (percent).	TAS:	True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- SAR decreases 0.2% for every +10°C and increases 0.2% for every -10°C difference from ISA.
- N₁ decreases 1% for every +5°C and increases 1% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

LANDING GEAR EXTENDED REVENUE OPERATIONS PROCEDURES

OPERATIONAL LIMITATIONS

The following are the FAA Airplane Flight Manual mandated limitations for gear down operations. Limitations are unchanged from normal except as listed below.

1. All components required for a landing gear extended operation must be functional in accordance with the appropriate maintenance manual.
2. The use of speed increase for improved climb performance in order to increase maximum takeoff weight is prohibited.
3. Dispatch into known icing conditions is prohibited.
4. The airplane is not eligible for extended over-water operations when landing gear down lock pins are installed. "Extended over-water operation" includes any operation over water at a horizontal distance of more than 50 nautical miles from the nearest shoreline.
5. Use of reduced thrust takeoff is prohibited.
6. Limitations relating to engine-out drift down are contained in the FLIGHT PLANNING and ABNORMAL sections of this Operational Data Manual (ODM).
7. Takeoff is limited to Flaps 5.
8. V_{MO} and M_{MO} are reduced to 270 KIAS and .73 Mach.
9. The airspeed indicator and Mach-airspeed warning switch must be reprogrammed for V_{MO} and M_{MO} .
10. Alternate EEC Mode prohibited.

PREPARATION OF AIRCRAFT

Maintenance will prepare the aircraft in accordance with the appropriate Maintenance Manual Procedures and make the appropriate log book entries.

EMERGENCY PROCEDURES

Procedures are unchanged for Emergency Procedures except as follows:

Emergency Descent: **Target speed is 270 KIAS**

NORMAL PROCEDURES

Operating Procedures are unchanged except as follows:

Severe Turbulent Air Penetration: The conditions for severe turbulence penetration are unchanged except the recommended airspeed for flight is $V_{Ref} + 70$ KIAS.

LANDING GEAR EXTENDED REVENUE OPERATIONS

DRIFTDOWN PERFORMANCE

FEET

GROSS WEIGHT - POUNDS		OPTIMUM DRIFT DOWN SPEED - KIAS	GROSS LEVEL OFF ALTITUDE - FEET		
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)		ISA + 10°C & COLDER	ISA + 15°C	ISA + 20°C
340,000	321,000	219	1,600		
320,000	303,000	213	4,600	3,200	
300,000	284,000	209	7,300	6,500	4,300
280,000	267,000	204	10,000	9,700	7,800
260,000	248,000	199	12,300	12,300	11,000
240,000	226,000	194	14,400	14,300	13,700
220,000	211,000	189	17,700	17,600	16,600

BASIS:

- One engine inoperative, APU operating
- Maximum Continuous Thrust Limits
- No Anti-Ice, one pack on
- 100 ft/min residual rate of climb

LANDING GEAR EXTENDED REVENUE OPERATIONS

LONG RANGE CRUISE ALTITUDE CAPABILITY

FEET

GROSS WEIGHT - POUNDS	ISA + 10°C & COLDER	ISA + 15°C	ISA + 20°C
310,000	1,100		
300,000	3,100		
290,000	5,100	2,800	
280,000	6,900	5,500	1,400
270,000	8,700	7,800	4,700
260,000	10,400	10,000	7,500
250,000	12,000	11,800	9,900
240,000	13,200	13,100	12,200
230,000	14,100	14,100	13,500
220,000	16,600	16,500	14,600

CORRECTIONS:

CONFIGURATION	CORRECTION – FEET
Packs OFF	+ 300
Engine Anti-Ice ON	- 2,700
Engine and Wing Anti-Ice ON	- 5,000
APU OFF	- 200

BASIS:

- One engine inoperative, APU operating
- Maximum Continuous Thrust Limits
- 100 ft/min residual rate of climb

LANDING GEAR EXTENDED REVENUE OPERATIONS

LONG RANGE CRUISE

ALTITUDE - FEET	GROSS WEIGHT - POUNDS CRUISE SPEED - KIAS TARGET N ₁ - PERCENT							
	270,000	260,000	250,000	240,000	230,000	220,000	210,000	200,000
18,000						184 108.2	180 105.2	176 102.2
17,000					189 108.8	185 105.8	181 103.8	177 100.8
16,000				192 109.3	189 106.4	187 103.8	183 101.2	179 98.6
15,000				194 107.1	191 104.4	188 102.2	184 100.0	180 97.8
14,000				195 104.8	192 102.7	189 101.0	185 99.3	181 97.6
13,000			199 105.2	196 103.2	193 101.5	190 99.8	186 98.1	182 96.4
12,000		203 105.6	200 103.6	197 102.0	194 100.4	190 98.7	186 97.0	182 95.3
11,000	206 105.8	204 104.0	201 102.4	198 100.8	194 99.2	191 97.8	187 96.4	183 95.0
10,000	208 104.3	205 102.8	202 101.2	198 99.7	195 98.3	192 97.0	188 95.7	184 94.4

NOTE:

- For estimated fuel burn, increase ABNORMAL One Engine Inoperative LRC fuel burn data by approximately 76%.

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

APPLICABILITY

The tables on the following pages provide landing distances and approach speeds to be used in the event of in-flight system failures. **The values in this section are not to be used for dispatch purposes.**

Refer to the “MEL Support” pages at the end of this section of the ODM for dispatch landing distances with the following MELs applied:

- Anti-skid Inoperative
- One Brake Deactivated
- Auto Spoilers Inoperative

The landing distances provided in this section are classified by runway braking action. These classifications include “DRY,” “GOOD,” “MEDIUM,” or “POOR.” Refer to the Airway Manual – Section 4 (Weather) to find the relationship between these terms, the current environmental conditions, and runway friction values.

ASSUMPTIONS

The data within this section was generated based on a set of assumed conditions:

- Standard day conditions
- No slope
- Operating engines at maximum reverse thrust, except for hydraulic system failures
- Maximum manual braking (more aggressive than Max Autobrakes)
- Includes distance from 50 feet above threshold to stop (1,500 feet of air distance)
- Each abnormal configuration landing distance table is based on the approach speed stated within each table.
- Based on demonstrated landing performance produced by the manufacturer during certification process

In addition, the data within this section were also calculated with certain baseline conditions. There are corrections provided for each abnormal configuration accounting for any variances from the following:

- Sea level altitude
- No wind

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET
KIAS**

AIR GROUND LOGIC IN AIR MODE, FLAPS 30

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	8,350	7,650	7,270	6,890	6,510	6,130	5,750	5,370
GOOD	11,270	10,350	9,810	9,270	8,730	8,190	7,650	7,110
MEDIUM	16,000	14,800	14,060	13,320	12,580	11,840	11,100	10,360
POOR	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000
Vapp - V_{Ref30}	160	153	146	141	136	131	126	121

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+200	+280	+410	N/A
Wind	Per 10 kt. headwind	-250	-400	-650	N/A
	Per 10 kt. tailwind	+850	+1350	+2300	N/A

AIRSPEED UNRELIABLE

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	5,400	5,000	4,740	4,480	4,220	3,960	3,700	3,440
GOOD	6,400	6,100	5,800	5,500	5,200	4,900	4,600	4,300
MEDIUM	9,080	8,600	8,160	7,720	7,280	6,840	6,400	5,960
POOR	12,400	11,700	11,040	10,380	9,720	9,060	8,400	7,740
Vapp - V_{Ref20}	170	165	160	155	150	144	139	133

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+200	+230	+340	+470
Wind	Per 10 kt. headwind	-210	-280	-440	-660
	Per 10 kt. tailwind	+750	+940	+1540	+2440

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET
KIAS**

ANTI-SKID INOPERATIVE, FLAPS 30

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	9,990	9,250	8,770	8,290	7,810	7,330	6,850	6,370
GOOD	11,070	10,250	9,690	9,130	8,570	8,010	7,450	6,890
MEDIUM	13,520	12,500	11,800	11,100	10,400	9,700	9,000	8,300
POOR	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000
V_{app} - V_{Ref30}	160	153	146	141	136	131	126	121

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+260	+310	+410	N/A
Wind	Per 10 kt. headwind	-400	-450	-600	N/A
	Per 10 kt. tailwind	+1300	+1550	+2300	N/A

FLAPS UP

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	7,450	6,750	6,370	5,990	5,610	5,230	4,850	4,470
GOOD	7,940	7,500	7,180	6,860	6,540	6,220	5,900	5,580
MEDIUM	10,980	10,300	9,800	9,300	8,800	8,300	7,800	7,300
POOR	14,000	13,300	12,600	11,900	11,200	10,500	9,800	9,100
V_{app} - V_{Ref30} +50	210	203	196	191	186	181	176	171

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+300	+300	+420	+530
Wind	Per 10 kt. headwind	-260	-290	-450	-660
	Per 10 kt. tailwind	+940	+980	+1570	+2410

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET
KIAS**

HYDRAULIC SYSTEM C INOP

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	5,700	5,300	5,060	4,820	4,580	4,340	4,100	3,860
GOOD	7,040	6,700	6,380	6,060	5,740	5,420	5,100	4,780
MEDIUM	9,400	8,900	8,440	7,980	7,520	7,060	6,600	6,140
POOR	11,980	11,300	10,660	10,020	9,380	8,740	8,100	7,460
V_{app} - V_{Ref20}	170	165	160	155	150	144	139	133

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+210	+260	+350	+450
Wind	Per 10 kt. headwind	-110	-290	-430	-620
	Per 10 kt. tailwind	+750	+980	+1520	+2300

HYDRAULIC SYSTEM C+L OR C+R INOP

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	6,500	6,100	5,840	5,580	5,320	5,060	4,800	4,540
GOOD	8,710	8,150	7,790	7,430	7,070	6,710	6,350	5,990
MEDIUM	12,200	11,400	10,820	10,240	9,660	9,080	8,500	7,920
POOR	15,900	15,100	14,300	13,500	12,700	11,900	11,100	10,300
V_{app} - V_{Ref30} + 20	180	173	166	161	156	151	146	141

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+240	+330	+470	+600
Wind	Per 10 kt. headwind	-250	-350	-550	-800
	Per 10 kt. tailwind	+750	+1150	+1850	+2950

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET
KIAS**

HYDRAULIC SYSTEM R & L INOP

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	6,080	5,700	5,460	5,220	4,980	4,740	4,500	4,260
GOOD	8,400	7,900	7,540	7,180	6,820	6,460	6,100	5,740
MEDIUM	12,310	11,550	11,010	10,470	9,930	9,390	8,850	8,310
POOR	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000	>15,000
V_{app} - V_{Ref30} + 20	180	173	166	161	156	151	146	141

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+190	+270	+400	N/A
Wind	Per 10 kt. headwind	-250	-260	-600	N/A
	Per 10 kt. tailwind	+800	+1150	+2050	N/A

LE SLAT ASYMMETRY, FLAPS 20 OR GREATER

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	5,770	5,150	4,810	4,470	4,130	3,790	3,450	3,110
GOOD	6,630	6,150	5,850	5,550	5,250	4,950	4,650	4,350
MEDIUM	8,960	8,300	7,860	7,420	6,980	6,540	6,100	5,660
POOR	11,580	10,700	10,100	9,500	8,900	8,300	7,700	7,100
V_{app} - V_{Ref30} + 20	180	173	166	161	156	151	146	141

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+150	+180	+280	+390
Wind	Per 10 kt. headwind	-220	-260	-400	-580
	Per 10 kt. tailwind	+750	+920	+1440	+2200

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET
KIAS**

LE SLAT ASYMMETRY, FLAPS LESS THAN 20

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	6,120	5,600	5,340	5,080	4,820	4,560	4,300	4,040
GOOD	7,240	6,800	6,500	6,200	5,900	5,600	5,300	5,000
MEDIUM	9,770	9,150	8,690	8,230	7,770	7,310	6,850	6,390
POOR	12,540	11,700	11,060	10,420	9,780	9,140	8,500	7,860
V_{app} - V_{Ref30} + 30	190	183	176	171	166	161	156	151

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+240	+270	+370	+480
Wind	Per 10 kt. headwind	-220	-280	-420	-620
	Per 10 kt. tailwind	+780	+960	+1500	+2300

ONE ENGINE INOPERATIVE

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	5,400	5,000	4,740	4,480	4,220	3,960	3,700	3,440
GOOD	6,400	6,100	5,800	5,500	5,200	4,900	4,600	4,300
MEDIUM	9,080	8,600	8,160	7,720	7,280	6,840	6,400	5,960
POOR	12,400	11,700	11,040	10,380	9,720	9,060	8,400	7,740
V_{app} - V_{Ref20}	170	165	160	155	150	144	139	133

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+200	+230	+340	+470
Wind	Per 10 kt. headwind	-210	-280	-440	-660
	Per 10 kt. tailwind	+750	+940	+1540	+2440

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET
KIAS**

TE FLAP ASYMMETRY, FLAPS 20 OR GREATER

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	5,180	4,800	4,560	4,320	4,080	3,840	3,600	3,360
GOOD	6,100	5,800	5,520	5,240	4,960	4,680	4,400	4,120
MEDIUM	8,270	7,850	7,430	7,010	6,590	6,170	5,750	5,330
POOR	10,750	10,150	9,590	9,030	8,470	7,910	7,350	6,790
V_{app} - V_{Ref20}	170	165	160	155	150	144	139	133

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+190	+220	+310	+410
Wind	Per 10 kt. headwind	-200	-260	-400	-580
	Per 10 kt. tailwind	+720	+900	+1420	+2170

TE FLAP ASYMMETRY, 5 < FLAPS < 20

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	5,700	5,200	4,940	4,680	4,420	4,160	3,900	3,640
GOOD	6,500	6,100	5,820	5,540	5,260	4,980	4,700	4,420
MEDIUM	8,880	8,300	7,880	7,460	7,040	6,620	6,200	5,780
POOR	11,500	10,700	10,120	9,540	8,960	8,380	7,800	7,220
V_{app} - V_{Ref30} + 20	180	173	166	161	156	151	146	141

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+220	+240	+340	+450
Wind	Per 10 kt. headwind	-220	-260	-400	-580
	Per 10 kt. tailwind	+750	+920	+1440	+2200

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET
KIAS**

TE FLAP ASYMMETRY, FLAPS 5 OR LESS

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	6,270	5,650	5,110	4,570	4,030	3,490	2,950	2,410
GOOD	7,030	6,550	6,250	5,950	5,650	5,350	5,050	4,750
MEDIUM	9,560	8,900	8,460	8,020	7,580	7,140	6,700	6,260
POOR	12,330	11,450	10,850	10,250	9,650	9,050	8,450	7,850
V_{app} - V_{Ref30} + 30	190	183	176	171	166	161	156	151

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+170	+190	+300	+420
Wind	Per 10 kt. headwind	-250	-250	-400	-600
	Per 10 kt. tailwind	+800	+950	+1450	+2250

TE FLAP DISAGREE

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	5,060	4,720	4,380	4,040	3,860	3,680	3,500	3,320
GOOD	5,950	5,690	5,430	5,170	4,930	4,690	4,450	4,210
MEDIUM	8,210	7,810	7,410	7,010	6,630	6,250	5,870	5,490
POOR	10,800	10,220	9,640	9,060	8,520	7,980	7,440	6,900
V_{app}-V_{Ref20}	170	165	160	155	150	144	139	133

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+90	+130	+200	+290
Wind	Per 10 kt. headwind	-140	-210	-340	-520
	Per 10 kt. tailwind	+500	+740	+1230	+1950

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET
KIAS**

THRUST REVERSER UNLOCKED

RWY COND. & APPCH SPEED	LANDING WEIGHT - POUNDS							
	360,000	340,000	320,000	300,000	280,000	260,000	240,000	220,000
DRY	6,400	5,800	5,520	5,240	4,960	4,680	4,400	4,120
GOOD	7,640	7,200	6,880	6,560	6,240	5,920	5,600	5,280
MEDIUM	10,850	10,150	9,630	9,110	8,590	8,070	7,550	7,030
POOR	14,220	13,500	12,800	12,100	11,400	10,700	10,000	9,300
V_{app} - V_{Ref30} + 30	190	183	176	171	166	161	156	151

CORRECTIONS		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+250	+280	+410	+540
Wind	Per 10 kt. headwind	-240	-300	-470	-720
	Per 10 kt. tailwind	+820	+1020	+1660	+2600

INTENTIONALLY BLANK

EMERGENCY LANDING DISTANCES

FEET

NOTE: TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

FLAPS 25

DATA IS ADVISORY AND DOES NOT INCLUDE 15% SAFETY MARGIN.

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).									
	DRY (6)						GOOD (5)			
	AB 1	AB 2	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	9,800	9,000	7,900	6,800	5,400	4,700	7,900	6,800	5,600	5,600
340,000	9,600	8,800	7,700	6,600	5,300	4,600	7,700	6,700	5,500	5,500
330,000	9,400	8,600	7,600	6,500	5,200	4,500	7,600	6,500	5,400	5,400
320,000	9,100	8,400	7,400	6,400	5,100	4,300	7,400	6,400	5,300	5,300
310,000	8,900	8,200	7,200	6,200	5,000	4,200	7,200	6,200	5,200	5,200
300,000	8,600	8,000	7,100	6,100	4,900	4,100	7,100	6,100	5,100	5,100
295,000	8,500	7,900	7,000	6,000	4,800	4,100	7,000	6,000	5,000	5,000
290,000	8,400	7,800	6,900	5,900	4,800	4,000	6,900	6,000	5,000	4,900
280,000	8,200	7,600	6,700	5,800	4,700	3,900	6,700	5,800	4,900	4,800
270,000	7,900	7,400	6,500	5,700	4,600	3,800	6,500	5,700	4,800	4,700
260,000	7,700	7,100	6,400	5,500	4,500	3,700	6,400	5,500	4,700	4,600
250,000	7,400	6,900	6,200	5,400	4,400	3,600	6,200	5,400	4,500	4,500
240,000	7,200	6,700	6,000	5,200	4,300	3,500	6,000	5,300	4,400	4,400
230,000	7,000	6,500	5,900	5,100	4,200	3,400	5,900	5,100	4,300	4,300
220,000	6,700	6,300	5,700	5,000	4,100	3,200	5,700	5,000	4,200	4,200

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)						GOOD (5)			
0	-500	-500	-400	-300	-200	-200	-400	-300	-300	-300
2,000	0	0	0	0	0	0	0	0	0	0
4,000	500	500	400	300	200	200	400	300	300	300
6,000	1,100	1,000	800	600	500	400	800	600	500	500
8,000	1,600	1,400	1,200	1,000	700	600	1,200	1,000	800	800

CORRECTIONS

	DRY (6)						GOOD (5)			
PER 1 KT HEADWIND	-50	-50	-50	-50	0	0	-50	-50	0	0
PER 1 KT TAILWIND	150	100	100	100	50	50	100	100	100	100
PER 5 KTS ADD'L SPD	300	350	350	300	250	150	350	300	250	150
PER 10°C ABOVE ISA	250	250	200	150	100	100	200	150	150	150
PER 10°C BELOW ISA	-250	-250	-200	-150	-100	-100	-200	-150	-150	-100
PER 1% UP SLOPE	-250	-150	0	0	0	-50	0	0	-50	-100
PER 1% DOWN SLOPE	200	50	0	0	0	50	0	0	100	150
1 REVERSER INOP	500	200	0	0	0	100	0	0	200	300
2 REVERSERS INOP	700	200	0	0	0	300	0	100	500	600
MANUAL SPOILERS	0	0	0	0	0	400	0	0	0	400

Note: Do not operate when Braking Action is Nil.

EMERGENCY LANDING DISTANCES

FEET

NOTE: TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

DATA IS ADVISORY AND DOES NOT INCLUDE 15% SAFETY MARGIN.

FLAPS 25

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).							
	MEDIUM (3)				POOR (1)			
	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	8,400	7,700	7,700	7,700	10,100	10,000	10,000	10,000
340,000	8,200	7,500	7,500	7,500	9,800	9,800	9,800	9,800
330,000	8,000	7,400	7,300	7,300	9,600	9,500	9,500	9,500
320,000	7,800	7,200	7,200	7,200	9,300	9,300	9,300	9,300
310,000	7,700	7,000	7,000	7,000	9,100	9,000	9,000	9,000
300,000	7,500	6,900	6,800	6,800	8,900	8,800	8,800	8,800
295,000	7,400	6,800	6,700	6,700	8,700	8,700	8,700	8,700
290,000	7,300	6,700	6,600	6,600	8,600	8,600	8,600	8,600
280,000	7,100	6,500	6,500	6,500	8,400	8,300	8,300	8,300
270,000	6,900	6,400	6,300	6,300	8,100	8,100	8,100	8,100
260,000	6,800	6,200	6,100	6,100	7,900	7,800	7,800	7,800
250,000	6,600	6,000	6,000	6,000	7,700	7,600	7,600	7,600
240,000	6,400	5,800	5,800	5,800	7,400	7,400	7,400	7,400
230,000	6,200	5,700	5,600	5,600	7,200	7,100	7,100	7,100
220,000	6,000	5,500	5,500	5,500	6,900	6,900	6,900	6,900

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •
Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	MEDIUM (3)				POOR (1)			
0	-400	-400	-400	-400	-600	-600	-600	-600
2,000	0	0	0	0	0	0	0	0
4,000	400	400	400	400	600	600	600	600
6,000	900	800	800	800	1,200	1,200	1,200	1,200
8,000	1,300	1,200	1,200	1,200	1,700	1,700	1,700	1,700

CORRECTIONS	MEDIUM (3)				POOR (1)			
PER 1 KT HEADWIND	-50	-50	-50	-50	-50	-50	-50	-50
PER 1 KT TAILWIND	150	150	100	150	200	200	200	200
PER 5 KTS ADD'L SPD	350	300	250	250	350	250	250	250
PER 10°C ABOVE ISA	200	200	200	200	250	250	250	250
PER 10°C BELOW ISA	-200	-200	-200	-200	-250	-250	-250	-250
PER 1% UP SLOPE	-100	-150	-250	-250	-400	-500	-500	-500
PER 1% DOWN SLOPE	200	300	350	300	750	800	800	800
1 REVERSER INOP	400	600	700	700	1,300	1,500	1,500	1,500
2 REVERSERS INOP	1,100	1,500	1,600	1,600	3,700	3,800	3,800	3,800
MANUAL SPOILERS	0	0	0	400	0	0	0	400

Note: Do not operate when Braking Action is Nil.

EMERGENCY LANDING DISTANCES

FEET

NOTE: TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

FLAPS 30

DATA IS ADVISORY AND DOES NOT INCLUDE 15% SAFETY MARGIN.

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).									
	DRY (6)						GOOD (5)			
	AB 1	AB 2	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	9,400	8,500	7,400	6,300	5,100	4,500	7,400	6,400	5,400	5,400
340,000	9,200	8,300	7,200	6,200	5,000	4,300	7,200	6,200	5,300	5,300
330,000	8,900	8,100	7,000	6,100	4,900	4,200	7,000	6,100	5,200	5,200
320,000	8,700	7,900	6,900	6,000	4,800	4,100	6,900	6,000	5,100	5,100
310,000	8,500	7,700	6,700	5,800	4,700	4,000	6,700	5,800	5,000	5,000
300,000	8,300	7,600	6,600	5,700	4,600	4,000	6,600	5,700	4,900	4,900
295,000	8,200	7,500	6,500	5,600	4,600	3,900	6,500	5,700	4,900	4,800
290,000	8,100	7,400	6,400	5,600	4,500	3,900	6,400	5,600	4,800	4,800
280,000	7,800	7,200	6,200	5,400	4,400	3,800	6,200	5,500	4,700	4,700
270,000	7,600	7,000	6,100	5,300	4,300	3,700	6,100	5,300	4,600	4,600
260,000	7,400	6,800	5,900	5,200	4,200	3,600	5,900	5,200	4,500	4,500
250,000	7,200	6,600	5,800	5,000	4,100	3,500	5,800	5,100	4,400	4,300
240,000	7,000	6,400	5,600	4,900	4,100	3,400	5,600	4,900	4,300	4,200
230,000	6,700	6,200	5,400	4,800	4,000	3,300	5,400	4,800	4,200	4,100
220,000	6,500	6,000	5,300	4,700	3,900	3,200	5,300	4,700	4,100	4,000

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)						GOOD (5)			
0	-500	-400	-400	-300	-200	-200	-400	-300	-200	-200
2,000	0	0	0	0	0	0	0	0	0	0
4,000	500	400	400	300	200	200	400	300	200	200
6,000	1,000	900	700	600	400	400	700	600	500	500
8,000	1,500	1,300	1,100	900	700	500	1,100	900	700	700

CORRECTIONS

	DRY (6)						GOOD (5)			
PER 1 KT HEADWIND	-50	-50	-50	0	0	0	-50	-50	0	0
PER 1 KT TAILWIND	150	100	100	100	50	50	100	100	50	50
PER 5 KTS ADD'L SPD	300	350	350	300	200	150	350	300	200	200
PER 10°C ABOVE ISA	250	200	200	150	100	100	200	150	100	100
PER 10°C BELOW ISA	-250	-200	-200	-150	-100	-100	-200	-150	-100	-100
PER 1% UP SLOPE	-200	-100	0	0	0	-50	0	0	-50	-100
PER 1% DOWN SLOPE	150	0	0	0	0	50	0	0	150	150
1 REVERSER INOP	300	0	0	0	0	100	0	0	200	200
2 REVERSERS INOP	400	0	0	0	0	200	0	100	400	400
MANUAL SPOILERS	0	0	0	0	0	400	0	0	0	400

Note: Do not operate when Braking Action is Nil.

EMERGENCY LANDING DISTANCES

FEET

NOTE: TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

DATA IS ADVISORY AND DOES NOT INCLUDE 15% SAFETY MARGIN.

FLAPS 30

Landing Weight (lb)	NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).							
	MEDIUM (3)				POOR (1)			
	AB 3	AB 4	Max AB	Max Manual	AB 3	AB 4	Max AB	Max Manual
350,000	7,900	7,500	7,500	7,500	9,900	9,900	9,900	9,900
340,000	7,800	7,300	7,300	7,300	9,600	9,600	9,600	9,600
330,000	7,600	7,200	7,200	7,200	9,400	9,400	9,400	9,400
320,000	7,400	7,000	7,000	7,000	9,100	9,100	9,100	9,100
310,000	7,200	6,800	6,800	6,800	8,900	8,900	8,900	8,900
300,000	7,100	6,700	6,700	6,600	8,700	8,700	8,700	8,700
295,000	7,000	6,600	6,600	6,600	8,500	8,500	8,500	8,500
290,000	6,900	6,500	6,500	6,500	8,400	8,400	8,400	8,400
280,000	6,700	6,400	6,400	6,300	8,200	8,200	8,200	8,200
270,000	6,600	6,200	6,200	6,100	7,900	7,900	7,900	7,900
260,000	6,400	6,000	6,000	6,000	7,700	7,700	7,700	7,700
250,000	6,200	5,900	5,900	5,800	7,500	7,500	7,500	7,500
240,000	6,100	5,700	5,700	5,600	7,200	7,200	7,200	7,200
230,000	5,900	5,600	5,600	5,500	7,000	7,000	7,000	7,000
220,000	5,700	5,400	5,400	5,300	6,700	6,700	6,700	6,700

BASIS: Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •
Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.

Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	MEDIUM (3)				POOR (1)			
0	-400	-400	-400	-400	-600	-600	-600	-600
2,000	0	0	0	0	0	0	0	0
4,000	400	400	400	400	600	600	600	600
6,000	800	800	800	800	1,100	1,100	1,100	1,100
8,000	1,300	1,100	1,100	1,100	1,700	1,700	1,700	1,700

CORRECTIONS	MEDIUM (3)				POOR (1)			
PER 1 KT HEADWIND	-50	-50	-50	-50	-50	-50	-50	-50
PER 1 KT TAILWIND	150	150	100	150	200	200	200	200
PER 5 KTS ADD'L SPD	350	300	250	250	350	300	300	300
PER 10°C ABOVE ISA	200	200	200	200	250	250	250	250
PER 10°C BELOW ISA	-200	-200	-200	-200	-250	-250	-250	-250
PER 1% UP SLOPE	-150	-200	-250	-250	-450	-500	-500	-500
PER 1% DOWN SLOPE	200	350	350	350	800	800	800	800
1 REVERSER INOP	400	500	600	600	1,200	1,200	1,200	1,200
2 REVERSERS INOP	1,000	1,300	1,300	1,300	3,000	3,000	3,000	3,000
MANUAL SPOILERS	0	0	0	400	0	0	0	400

Note: Do not operate when Braking Action is Nil.

OPERATION WITHOUT AIRSPEED INDICATION

Use the following pitch attitude and thrust setting data to estimate airspeed and rate of climb/descent, if the airspeed system becomes unreliable or unusable enroute. ***If the damage to the airspeed indication system is detected during early stages of the flight (takeoff or initial climb), return to departure airport.***

CLIMB					
SPEED: 290/0.78			THRUST: MAX CLIMB FLAPS: UP		
PRESSURE ALTITUDE - FEET		GROSS WEIGHT - POUNDS			
		353,000	309,000	265,000	220,000
40,000	PITCH ATTITUDE RATE OF CLIMB (FT/MIN)		3.5 0	3.6 + 600	3.6 + 1,300
30,000	PITCH ATTITUDE RATE OF CLIMB (FT/MIN)	3.3 + 900	3.3 + 1,200	3.3 + 1,600	3.5 + 2,100
20,000	PITCH ATTITUDE RATE OF CLIMB (FT/MIN)	4.9 + 1,700	5.0 + 2,100	5.2 + 2,600	5.6 + 3,200
10,000	PITCH ATTITUDE RATE OF CLIMB (FT/MIN)	6.6 + 2,400	6.8 + 2,900	7.4 + 3,500	8.3 + 4,300
0	PITCH ATTITUDE RATE OF CLIMB (FT/MIN)	7.9 + 2,700	8.3 + 3,200	9.1 + 3,900	10.3 + 4,800

CRUISE					
SPEED: 0.78/290			THRUST: %N ₁ FOR LEVEL FLIGHT FLAPS: UP		
PRESSURE ALTITUDE - FEET		GROSS WEIGHT - POUNDS			
		353,000	309,000	265,000	220,000
40,000	PITCH ATTITUDE % N ₁		+ 3.4 106	+ 2.7 96	+ 2.0 91
35,000	PITCH ATTITUDE % N ₁	+ 2.9 99	+ 2.4 94	+ 1.8 91	+ 1.3 88
30,000	PITCH ATTITUDE % N ₁	+ 2.2 94	+ 1.8 91	+ 1.3 89	+ 0.8 87

DESCENT					
SPEED: 0.78/290			THRUST: IDLE FLAPS: UP		
PRESSURE ALTITUDE - FEET		GROSS WEIGHT - POUNDS			
		353,000	309,000	265,000	220,000
40,000	PITCH ATTITUDE		0.0	- 0.5	-1.3
	RATE OF CLIMB (FT/MIN)		-2,700	-2,600	-2,600
30,000	PITCH ATTITUDE	+ 0.5	-1.1	-1.8	-2.6
	RATE OF CLIMB (FT/MIN)	-2,200	-2,300	-2,500	-2,800
20,000	PITCH ATTITUDE	- 0.4	-1.1	-1.9	-2.9
	RATE OF CLIMB (FT/MIN)	-2,000	-2,100	-2,300	-2,600
10,000	PITCH ATTITUDE	- 0.4	-1.1	-1.9	-2.9
	RATE OF CLIMB (FT/MIN)	-1,700	-1,800	-2,000	-2,200

OPERATION WITHOUT AIRSPEED INDICATION

Use the following pitch attitude and thrust setting data to estimate airspeed and rate of climb/descent, if the airspeed system becomes unreliable or unusable enroute. ***If the damage to the airspeed indication system is detected during early stages of the flight (takeoff or initial climb), return to departure airport.***

HOLDING					
SPEED: $V_{Ref30} + 80$		THRUST: %N ₁ FOR LEVEL FLIGHT FLAPS: UP			
PRESSURE ALTITUDE - FEET		GROSS WEIGHT - POUNDS			
		353,000	309,000	265,000	220,000
10,000	PITCH ATTITUDE % N ₁	+ 5.2 75	+ 5.2 72	+ 4.8 68	+ 4.3 64

TERMINAL AREA						
SPEED: AS REQ'D			THRUST: %N ₁ FOR LEVEL FLIGHT FLAPS: AS REQ'D			
PRESSURE ALTITUDE - FEET	FLAPS, SPEED		GROSS WEIGHT - POUNDS			
			353,000	309,000	265,000	220,000
5,000	UP $V_{Ref30} + 80$	PITCH ATT % N ₁	+ 5.2 71	+ 5.2 67	+ 4.8 64	+ 4.4 60
5,000	1 $V_{Ref30} + 60$	PITCH ATT % N ₁	+ 6.9 73	+ 6.9 69	+ 6.6 65	+ 6.2 60
5,000	5 $V_{Ref30} + 40$	PITCH ATT % N ₁	+ 6.1 76	+ 6.3 72	+ 5.9 68	+ 5.5 63
5,000	15 $V_{Ref30} + 20$	PITCH ATT % N ₁	+ 7.1 77	+ 7.6 73	+ 7.4 69	+ 7.1 63
5,000	20 $V_{Ref30} + 20$	PITCH ATT % N ₁	+ 5.8 78	+ 6.3 76	+ 6.0 70	+ 5.7 65

FINAL APPROACH						
SPEED: AS REQ'D			THRUST: %N ₁ FOR 3° GLIDESLOPE FLAPS: AS REQ'D			
PRESSURE ALTITUDE - FEET	FLAPS, SPEED		GROSS WEIGHT - POUNDS			
			353,000	309,000	265,000	220,000
1,500	25 $V_{Ref25} + 10$	PITCH ATT % N ₁	3.8 67	3.7 63	3.5 59	3.3 54
1,500	30 $V_{Ref30} + 10$	PITCH ATT % N ₁	1.0 72	1.6 68	1.6 64	1.5 59

BRAKE COOLING FOLLOWING LANDING

GOVERNING CONDITIONS

NOTE: Maximum Quick Turnaround Landing Weight (QTLW) is not limiting for most normal operations.

If any of the following conditions apply, accomplish the procedures below to determine QTLW and Brake Cooling requirements.

- “QTLW Warning Remark” appears on the WDR or
- Landing above MLW or
- Landing within 23,000 lbs of MLW using Flaps 30 at an altitude of 3,000 feet or above or
- Landing within 20,200 lbs of MLW using Flaps 25 at an altitude of up to 3,000 feet or
- Landing using Flaps 25 above 3,000 feet.
- Landing with non-standard aircraft configurations (flaps inoperative, brake deactivated,...etc.)

PROCEDURES

- A) Determine if the Maximum Quick Turn Landing Weight has been exceeded.
- B) Obtain a Landing Brake Cooling time.
- C) **Wait the longer of the two times** once the aircraft is parked at the gate with the parking brake off.

QUICK TURNAROUND LANDING WEIGHT

1. BTMS OPERATIVE

Check the BTMS display on EICAS no sooner than 10 minutes and no later than 15 minutes after parking.

If any brake temperature value is 5 or higher or BRAKE TEMP light is on then:

A **60 minute** ground cooling period is required.

NOTE: If any brake temperature display is blank or indicates 0, the BTMS INOPERATIVE Method must be used.

2. BTMS INOPERATIVE

Determine the Maximum Quick Turnaround Landing Weight from Page 4-41.

If the Actual Landing Weight is greater than the Maximum Quick Turnaround Landing Weight then:

A **60 minute** ground cooling period is required.

NOTE: Check that wheel thermal plugs have not melted before executing a takeoff.

LANDING BRAKE COOLING

1. BTMS OPERATIVE

- a) Check the BTMS display on EICAS no sooner than 10 minutes and no later than 15 minutes after parking.
- b) Use the highest value to enter the BTMS Operative Brake Cooling table for ground from Page 4-42.
- c) Wait the specified time associated with the value from the BTMS indicator.

NOTE: If any brake temperature display is blank or indicates 0, the BTMS INOPERATIVE Method must be used.

2. BTMS INOPERATIVE

Determine the Cooling Time and associated action if applicable from the Brake Cooling Time and AutoBrake Adjustment tables on Page 4-43. Comply with the specified procedures for the Caution Zone and Fuse Plug Melt Zone.

BRAKE COOLING FOLLOWING LANDING
MAXIMUM QUICK TURNAROUND LANDING WEIGHT
POUNDS

FLAPS 30

AIRPORT PRESSURE ALTITUDE - FT.	AMBIENT TEMPERATURE- °C							
	-20	-10	0	10	20	30	40	50
-1000	351,800	345,800	340,000	335,000	329,700	325,100	321,000	316,700
0	346,200	340,300	335,000	330,000	325,200	320,600	316,000	311,200
1,000	341,000	335,300	330,000	325,000	321,100	315,300	310,600	305,800
2,000	336,000	330,300	325,100	320,100	315,000	309,800	304,900	300,000
3,000	331,000	325,200	320,100	314,700	329,000	304,000	299,000	294,200
4,000	325,600	320,100	314,800	309,000	303,300	298,200	293,200	----
5,000	320,500	314,800	308,800	303,000	297,900	292,900	288,100	----
6,000	315,000	309,000	303,000	297,400	292,200	287,400	282,900	----
7,000	309,000	303,000	297,100	292,000	287,000	282,100	277,600	----
8,000	303,100	297,100	291,400	286,200	281,300	276,800	272,200	----

FLAPS 25

AIRPORT PRESSURE ALTITUDE - FT.	AMBIENT TEMPERATURE- °C							
	-20	-10	0	10	20	30	40	50
-1000	334,500	327,700	320,100	315,200	309,700	304,500	299,800	295,000
0	328,200	321,700	315,300	309,800	304,200	299,100	294,400	290,000
1,000	322,000	315,600	305,600	304,000	298,800	293,000	289,100	284,800
2,000	316,100	310,000	304,000	298,800	293,500	288,800	284,500	279,700
3,000	310,100	304,100	298,700	293,200	288,100	283,300	279,000	274,800
4,000	304,800	298,800	293,000	288,000	283,000	278,200	274,000	----
5,000	299,000	293,100	287,900	282,600	277,900	273,100	268,900	----
6,000	293,800	288,000	282,400	277,300	272,700	268,000	264,000	----
7,000	288,000	282,400	277,000	272,200	267,700	263,100	259,000	----
8,000	282,700	277,000	271,900	267,000	262,400	258,100	255,000	----

NOTE: Weights in shaded area are above the maximum landing weight.

CORRECTIONS:

CONDITION		CORRECTION – POUNDS
Wind	per 1 kt. of headwind	+ 700
	per 1 kt. of tailwind	- 3,700
Runway slope	per 0.1% uphill slope	+ 275
	per 0.1% downhill slope	- 550
One brake deactivated		- 22,200

BRAKE COOLING FOLLOWING LANDING BTMS OPERATIVE BRAKE COOLING

(minutes)

	BTMS Indication						
	Up to 1	1	2	3	4	5 - 6	7 +
Ground	0	13	30	43	53	Caution Zone	Fuse Plug
In-Flight Gear Down *	0	2	3	4	5		Melt Zone

NOTE: A BTMS indication of 5 or higher will cause the Brake Temp Light to illuminate. The light will extinguish when the temperature decreases to 4.

- The In-Flight Gear Down cooling times are for use **ONLY** after waiting the duration of the ground cooling time and BTMS indicates overheating on the subsequent takeoff.
- The values above also pertain to rejected takeoff.

BRAKE COOLING FOLLOWING LANDING

LANDING BRAKE COOLING

(BTMS INOPERATIVE)

LANDING USING MAX MANUAL BRAKING:

Obtain a brake cooling time from the following table. A quick assessment can be made by using the next highest weight and speed. If the resulting wait time has the potential of causing a delay or is in the Caution or Fuse Plug Melt Zones, interpolation may be used to determine a more precise wait time with the associated zone action. Zones are indicated in the table for quicker identification. Refer to the time ranges for Caution and Fuse Plug Melt Zones below.

BRAKE COOLING TIME (h:mm)

WEIGHT (1,000 lbs)	Brakes on Speed (Ground Speed KTS)					
	80	100	120	140	160	180
350	0:10	0:16	0:35	0:54	1:16C	1:36F
340	0:10	0:15	0:33	0:51	1:13C	1:33F
330	0:10	0:14	0:31	0:49	1:10C	1:30F
320	0:10	0:13	0:29	0:47	1:07C	1:26F
310	0:10	0:11	0:27	0:45	1:04C	1:23F
300	0:10	0:10	0:25	0:43	1:01C	1:19F
290	0:10	0:10	0:23	0:40	0:58	1:16C
280	0:10	0:10	0:22	0:38	0:55	1:12C
270	0:10	0:10	0:20	0:35	0:52	1:09C
260	0:10	0:10	0:18	0:33	0:49	1:06C
250	0:10	0:10	0:16	0:30	0:46	1:02C
240	0:10	0:10	0:14	0:28	0:43	0:58
230	0:10	0:10	0:13	0:25	0:40	0:55
220	0:10	0:10	0:11	0:23	0:37	0:51

C - CAUTION ZONE (1:00-1:16) – Fuse plugs may melt. Wait the specified time. After the landing gear assembly has cooled, visually inspect for tire damage and seal leakage.

F - FUSE PLUG MELT ZONE (Shaded Region, 1:17 +) – Under these conditions, consider that the fuse plugs will likely melt and deflate the tires. Unless required, do not set parking brake. The possibility of tire, grease or hydraulic fluid fires should also be considered. Maintenance inspection of tires, wheels and brakes is recommended.

LANDING USING AUTOBRAKES:

- 1) Determine the time from the table above. This is the reference time.
- 2) Subtract the times in the adjustment table below from the reference time in the table above to get proper cooling time for the respective brake setting. **Any resulting wait time of 1:17 or above is in the Fuse Plug Melt Zone.**

AUTOBRAKE ADJUSTMENT

NW INDICATES NO WAITING REQUIRED

	Brakes on Speed (Ground Speed KTS)					
	80	100	120	140	160	180
	No Reverse Thrust Credit					
MaxAuto	NW	0:02	0:03	0:04	0:05	0:05
Auto 4	NW	0:05	0:07	0:10	0:10	0:09
Auto 3	NW	NW	0:10	0:13	0:15	0:16
Auto 2	NW	NW	0:15	0:21	0:21	0:21
Auto 1	NW	NW	0:22	0:23	0:25	0:27

BRAKE COOLING FOLLOWING REJECTED TAKEOFF

REJECTED TAKEOFF BRAKE COOLING

PROCEDURES

BTMS OPERATIVE:

- 1) Check the brake temperature indication on EICAS no sooner than 10 minutes and no later than 15 minutes after parking.
- 2) Use the highest value to enter the following BTMS Operative Brake Cooling table from Page 4-42.
- 3) Wait the specified time associated with the value from the BTMS indicator prior to subsequent takeoff.

BTMS INOPERATIVE:

Use the table below. A quick assessment can be made by using the next highest weight and speed. If the resulting wait time has the potential of causing a delay or is in the Caution or Fuse Plug Melt Zones, interpolation may be used to determine a more precise wait time with the associated zone action. Zones are indicated in the table for quicker identification. Refer to the time ranges for Caution and Fuse Plug Melt Zones below.

NOTE: All wait times begin once the aircraft is parked at the gate or other designated area.

BRAKE COOLING TIME (h:mm)

WEIGHT (1,000 lbs)	Brakes on Speed (Ground Speed KTS)					
	80	100	120	140	160	180
350	0:10	0:25	0:46	1:08C	1:34F	1:59F
340	0:10	0:23	0:44	1:05C	1:31F	1:55F
330	0:10	0:22	0:42	1:02C	1:27F	1:51F
320	0:10	0:20	0:40	1:00C	1:23F	1:47F
310	0:10	0:19	0:38	0:57	1:20F	1:43F
300	0:10	0:17	0:35	0:54	1:16C	1:38F
290	0:10	0:16	0:33	0:51	1:13C	1:34F
280	0:10	0:14	0:31	0:49	1:09C	1:30F
270	0:10	0:13	0:28	0:46	1:06C	1:26F
260	0:10	0:11	0:26	0:44	1:02C	1:22F
250	0:10	0:10	0:24	0:41	0:58	1:18F
240	0:10	0:10	0:22	0:39	0:55	1:14C
230	0:10	0:10	0:20	0:35	0:51	1:10C
220	0:10	0:10	0:18	0:32	0:48	1:06C

C - CAUTION ZONE (1:00 – 1:16) – Fuse plugs may melt. Wait the specified time. After the landing gear assembly has cooled, visually inspect for tire damage and seal leakage.

F - FUSE PLUG MELT ZONE (Shaded Region, 1:17 +) – Under these conditions, consider that the fuse plugs will likely melt and deflate the tires. Unless required, do not set parking brake. The possibility of tire, grease or hydraulic fluid fires should also be considered. Maintenance inspection of tires, wheels and brakes is recommended.

MEL SUPPORT**V_{MCG} - MINIMUM CONTROL SPEED, GROUND****KIAS****CF6-80A2**

NO NOSEWHEEL STEERING

AIRPORT PRESSURE ALTITUDE - FEET	AMBIENT TEMPERATURE - °C						
	-10	0	10	20	30	40	50
0	109	109	109	109	108	106	100
1,000	108	107	107	107	107	104	97
2,000	106	106	106	106	106	102	95
3,000	105	105	105	105	104	100	
4,000	104	104	104	103	102	98	
5,000	103	102	102	102	100	96	
6,000	101	101	101	101	98	94	
7,000	99	99	99	99	96	92	
8,000	97	97	97	97	94	90	

MEL SUPPORT**V₁ MIN - EEC OFF: 73-21-01****KIAS****CF6-80A2**

AIRPORT PRESSURE ALTITUDE - FEET	AMBIENT TEMPERATURE - °C					
	0 & below	10	20	30	40	50
0	114	113	113	113	110	105
1,000	112	112	112	111	108	103
2,000	111	111	111	110	106	101
3,000	110	110	109	108	104	99
4,000	109	108	108	107	103	98
5,000	107	107	107	104	100	
6,000	106	105	105	102	99	
7,000	104	104	104	101	97	
8,000	102	102	102	99	95	

NOTE:

For operation with EEC (PMC) off, determine V_{1min} for existing airport temperature and pressure altitude conditions. Determine V_1 , V_R , V_2 for the appropriate operating conditions. Compare V_1 to V_{1min} . If V_1 is smaller and V_{1min} , increase the V_1 to be equal to V_{1min} . Also adjust V_R to be equal to or greater than V_{1min} .

MEL SUPPORT

TAKEOFF THRUST - EEC OFF: 73-21-01

% N₁

BASED ON FULL RATING

TO

40 TO 80 KNOTS

NORMAL BLEED - PACKS ON / ANTI-ICE OFF

CF6-80A2

OAT - °C	AIRPORT PRESSURE ALTITUDE - FEET									
	-1,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
54	106.9	107.4	107.4	107.4	107.4	107.4	107.4	107.4	107.4	107.4
52	107.5	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
50	108.1	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7
48	108.6	109.2	109.2	109.2	109.2	109.2	109.2	109.2	109.2	109.2
46	109.0	109.6	109.6	109.6	109.6	109.6	109.6	109.6	109.6	109.6
44	109.5	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0
42	109.8	110.4	110.4	110.4	110.4	110.4	110.4	110.4	110.4	110.4
40	110.2	110.9	110.9	110.9	110.9	110.9	110.9	110.9	110.9	110.9
38	110.7	111.3	111.3	111.3	111.3	111.3	111.3	111.3	111.3	111.3
36	111.1	111.7	111.7	111.7	111.7	111.7	111.7	111.7	111.7	111.7
34	111.6	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2
32	111.0	111.8	112.5	112.5	112.5	112.5	112.5	112.5	112.5	112.5
30	110.6	111.4	112.2	112.9	112.9	112.9	112.9	112.9	112.9	112.9
28	110.2	111.0	111.8	112.6	113.9	113.9	113.9	113.9	113.9	113.9
26	109.9	110.7	111.4	112.2	113.5	113.5	113.5	113.5	113.5	113.5
24	109.5	110.3	111.0	111.8	113.1	114.5	114.5	114.5	114.5	114.5
22	109.1	109.9	110.7	111.4	112.7	114.0	114.4	115.6	115.6	115.6
20	108.8	109.5	110.3	111.1	112.3	113.6	114.7	115.6	116.2	116.2
18	108.4	109.2	109.9	110.7	111.9	113.2	114.3	115.2	115.7	115.7
16	108.0	108.8	109.5	110.3	111.6	112.8	113.9	114.8	115.4	115.4
14	107.6	108.4	109.2	109.9	111.2	112.5	113.5	114.4	114.9	114.9
12	107.3	108.0	108.8	109.5	110.8	112.1	113.1	114.0	114.5	114.5
10	106.9	107.7	108.4	109.1	110.4	111.7	112.7	113.6	114.1	114.1
8	106.5	107.3	108.0	108.8	110.0	111.3	112.3	113.2	113.7	113.7
6	106.1	106.9	107.6	108.4	109.6	110.9	111.9	112.8	113.3	113.3
4	105.7	106.5	107.2	108.0	109.2	110.5	111.5	112.4	112.9	112.9
2	105.4	106.1	106.8	107.6	108.8	110.1	111.1	112.0	112.5	112.5
0	105.0	105.7	106.5	107.2	108.4	109.7	110.7	111.6	112.1	112.1
-2	104.6	105.3	106.1	106.8	108.0	109.3	110.3	111.2	111.7	111.7
-4	104.2	104.9	105.7	106.4	107.6	108.9	109.9	110.7	111.3	111.3
-6	103.8	104.6	105.3	106.0	107.2	108.5	109.5	110.3	110.9	110.9
-8	103.4	104.2	104.9	105.6	106.8	108.0	109.1	109.9	110.4	110.4
-10	103.0	103.8	104.5	105.2	106.4	107.6	108.7	109.5	110.0	110.0
-15	102.0	102.8	103.5	104.2	105.4	106.6	107.6	108.5	109.0	109.0
-20	101.0	101.8	102.5	103.2	104.4	105.6	106.6	107.4	107.9	107.9
-25	100.0	100.8	101.5	102.2	103.3	104.5	105.5	106.3	106.8	106.8
-30	99.0	99.7	100.4	101.1	102.3	103.5	104.4	105.2	105.8	105.8
-35	98.0	98.7	99.4	100.1	101.2	102.4	103.4	104.2	104.7	104.7
-40	97.0	97.7	98.3	99.0	100.1	101.3	102.3	103.1	103.5	103.5

CORRECTIONS:

CONFIGURATION	%N ₁ CORRECTION
Packs OFF	+ 0.3
Engine Anti-Ice ON	- 0.6 when OAT is above 10 °C

MEL SUPPORT**TAKEOFF THRUST – EEC OFF: 73-21-01****% N₁****AT55**

BASED ON FULL RATING AT 55°C ASSUMED TEMP

CF6-80A2

40 TO 80 KNOTS

NORMAL BLEED - PACKS ON / ANTI-ICE OFF

OAT - °C	AIRPORT PRESSURE ALTITUDE - FEET									
	-1,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
55	106.6	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1
54	106.4	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9
52	106.1	106.6	106.6	106.6	106.6	106.6	106.6	106.6	106.6	106.6
50	105.7	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2
48	105.4	105.9	105.9	105.9	105.9	105.9	105.9	105.9	105.9	105.9
46	105.1	105.6	105.6	105.6	105.6	105.6	105.6	105.6	105.6	105.6
44	104.8	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
42	104.4	104.9	104.9	104.9	104.9	104.9	104.9	104.9	104.9	104.9
40	104.1	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6
38	103.8	104.2	104.2	104.2	104.2	104.2	104.2	104.2	104.2	104.2
36	103.4	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9
34	103.1	103.6	103.6	103.6	103.6	103.6	103.6	103.6	103.6	103.6
32	102.8	103.2	103.2	103.2	103.2	103.2	103.2	103.2	103.2	103.2
30	102.4	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9
28	102.1	102.6	102.6	102.6	102.6	102.6	102.6	102.6	102.6	102.6
26	101.7	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
24	101.4	101.9	101.9	101.9	101.9	101.9	101.9	101.9	101.9	101.9
22	101.1	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5
20	100.7	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2
18	100.4	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8
16	100.0	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5
14	99.7	100.1	100.1	100.1	100.1	100.1	100.1	100.1	100.1	100.1
12	99.3	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8
10	99.0	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5
8	98.6	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1
6	98.3	98.7	98.7	98.7	98.7	98.7	98.7	98.7	98.7	98.7
4	97.9	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4
2	97.6	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0
0	97.2	97.7	97.7	97.7	97.7	97.7	97.7	97.7	97.7	97.7
-2	96.9	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3
-4	96.5	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0
-6	96.2	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6
-8	95.8	96.2	96.2	96.2	96.2	96.2	96.2	96.2	96.2	96.2
-10	95.4	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9
-15	94.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
-20	93.6	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1
-25	92.7	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1
-30	91.8	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2
-35	90.8	91.2	91.2	91.2	91.2	91.2	91.2	91.2	91.2	91.2
-40	89.9	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3

CORRECTIONS:

CONFIGURATION	%N ₁ CORRECTION
Packs OFF	+ 0.3
Engine Anti-Ice ON	- 0.6 when OAT is above 10 °C

MEL SUPPORT

TAKEOFF THRUST – EEC OFF: 73-21-01

% N₁

BASED ON FULL RATING AT 50°C ASSUMED TEMP

AT50

40 TO 80 KNOTS

NORMAL BLEED - PACKS ON / ANTI-ICE OFF

CF6-80A2

OAT - °C	AIRPORT PRESSURE ALTITUDE - FEET									
	-1,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
50	108.2	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7
48	107.8	108.4	108.4	108.4	108.4	108.4	108.4	108.4	108.4	108.4
46	107.5	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0
44	107.2	107.7	107.7	107.7	107.7	107.7	107.7	107.7	107.7	107.7
42	106.8	107.3	107.3	107.3	107.3	107.3	107.3	107.3	107.3	107.3
40	106.5	107.0	107.0	107.0	107.0	107.0	107.0	107.0	107.0	107.0
38	106.1	106.7	106.7	106.7	106.7	106.7	106.7	106.7	106.7	106.7
36	105.8	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3
34	105.5	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0
32	105.1	105.6	105.6	105.6	105.6	105.6	105.6	105.6	105.6	105.6
30	104.8	105.3	105.3	105.3	105.3	105.3	105.3	105.3	105.3	105.3
28	104.4	104.9	104.9	104.9	104.9	104.9	104.9	104.9	104.9	104.9
26	104.1	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6
24	103.7	104.2	104.2	104.2	104.2	104.2	104.2	104.2	104.2	104.2
22	103.4	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9
20	103.0	103.5	103.5	103.5	103.5	103.5	103.5	103.5	103.5	103.5
18	102.7	103.2	103.2	103.2	103.2	103.2	103.2	103.2	103.2	103.2
16	102.3	102.8	102.8	102.8	102.8	102.8	102.8	102.8	102.8	102.8
14	102.0	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5
12	101.6	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
10	101.3	101.8	101.8	101.8	101.8	101.8	101.8	101.8	101.8	101.8
8	100.9	101.4	101.4	101.4	101.4	101.4	101.4	101.4	101.4	101.4
6	100.6	101.0	101.0	101.0	101.0	101.0	101.0	101.0	101.0	101.0
4	100.2	100.7	100.7	100.7	100.7	100.7	100.7	100.7	100.7	100.7
2	99.8	100.3	100.3	100.3	100.3	100.3	100.3	100.3	100.3	100.3
0	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
-2	99.1	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6
-4	98.7	99.2	99.2	99.2	99.2	99.2	99.2	99.2	99.2	99.2
-6	98.4	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9
-8	98.0	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5
-10	97.6	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1
-15	96.7	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2
-20	95.8	96.2	96.2	96.2	96.2	96.2	96.2	96.2	96.2	96.2
-25	94.8	95.3	95.3	95.3	95.3	95.3	95.3	95.3	95.3	95.3
-30	93.9	94.3	94.3	94.3	94.3	94.3	94.3	94.3	94.3	94.3
-35	92.9	93.4	93.4	93.4	93.4	93.4	93.4	93.4	93.4	93.4
-40	91.9	92.4	92.4	92.4	92.4	92.4	92.4	92.4	92.4	92.4

CORRECTIONS:

CONFIGURATION	%N ₁ CORRECTION
Packs OFF	+ 0.3
Engine Anti-Ice ON	- 0.6 when OAT is above 10 °C

MEL SUPPORT

TAKEOFF THRUST – EEC OFF: 73-21-01

% N₁

AT45

BASED ON FULL RATING AT 45°C ASSUMED TEMP

CF6-80A2

40 TO 80 KNOTS
NORMAL BLEED - PACKS ON / ANTI-ICE OFF

OAT - °C	AIRPORT PRESSURE ALTITUDE - FEET									
	-1,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
45	109.3	109.7	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9
44	109.1	109.5	109.7	109.7	109.7	109.7	109.7	109.7	109.7	109.7
42	108.7	109.2	109.4	109.4	109.4	109.4	109.4	109.4	109.4	109.4
40	108.4	108.8	109.0	109.0	109.0	109.0	109.0	109.0	109.0	109.0
38	108.0	108.5	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7
36	107.7	108.1	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3
34	107.3	107.8	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0
32	107.0	107.4	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6
30	106.6	107.1	107.3	107.3	107.3	107.3	107.3	107.3	107.3	107.3
28	106.3	106.7	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9
26	105.9	106.4	106.6	106.6	106.6	106.6	106.6	106.6	106.6	106.6
24	105.6	106.0	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2
22	105.2	105.7	105.9	105.9	105.9	105.9	105.9	105.9	105.9	105.9
20	104.9	105.3	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5
18	104.5	104.9	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
16	104.2	104.6	104.8	104.8	104.8	104.8	104.8	104.8	104.8	104.8
14	103.8	104.2	104.4	104.4	104.4	104.4	104.4	104.4	104.4	104.4
12	103.4	103.9	104.1	104.1	104.1	104.1	104.1	104.1	104.1	104.1
10	103.1	103.5	103.7	103.7	103.7	103.7	103.7	103.7	103.7	103.7
8	102.7	103.1	103.3	103.3	103.3	103.3	103.3	103.3	103.3	103.3
6	102.3	102.8	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0
4	102.0	102.4	102.6	102.6	102.6	102.6	102.6	102.6	102.6	102.6
2	101.6	102.0	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
0	101.2	101.7	101.8	101.8	101.8	101.8	101.8	101.8	101.8	101.8
-2	100.9	101.3	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5
-4	100.5	100.9	101.1	101.1	101.1	101.1	101.1	101.1	101.1	101.1
-6	100.1	100.5	100.7	100.7	100.7	100.7	100.7	100.7	100.7	100.7
-8	99.8	100.2	100.3	100.3	100.3	100.3	100.3	100.3	100.3	100.3
-10	99.4	99.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
-15	98.4	98.8	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
-20	97.5	97.9	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1
-25	96.5	96.9	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1
-30	95.5	95.9	96.1	96.1	96.1	96.1	96.1	96.1	96.1	96.1
-35	94.6	95.0	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1
-40	93.6	94.0	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1

CORRECTIONS:

CONFIGURATION	%N ₁ CORRECTION
Packs OFF	+ 0.3
Engine Anti-Ice ON	- 0.6 when OAT is above 10 °C

MEL SUPPORT

TAKEOFF THRUST – EEC OFF: 73-21-01

% N₁

BASED ON FULL RATING AT 40°C ASSUMED TEMP

AT40

40 TO 80 KNOTS

NORMAL BLEED - PACKS ON / ANTI-ICE OFF

CF6-80A2

OAT - °C	AIRPORT PRESSURE ALTITUDE - FEET									
	-1,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
40	110.2	110.8	110.8	110.8	110.8	110.8	110.8	110.8	110.8	110.8
38	109.8	110.4	110.4	110.4	110.4	110.4	110.4	110.4	110.4	110.4
36	109.5	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0
34	109.1	109.7	109.7	109.7	109.7	109.7	109.7	109.7	109.7	109.7
32	108.8	109.3	109.3	109.3	109.3	109.3	109.3	109.3	109.3	109.3
30	108.4	109.0	109.0	109.0	109.0	109.0	109.0	109.0	109.0	109.0
28	108.1	108.6	108.6	108.6	108.6	108.6	108.6	108.6	108.6	108.6
26	107.7	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
24	107.4	107.9	107.9	107.9	107.9	107.9	107.9	107.9	107.9	107.9
22	107.0	107.5	107.5	107.5	107.5	107.5	107.5	107.5	107.5	107.5
20	106.6	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2
18	106.3	106.8	106.8	106.8	106.8	106.8	106.8	106.8	106.8	106.8
16	105.9	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4
14	105.5	106.1	106.1	106.1	106.1	106.1	106.1	106.1	106.1	106.1
12	105.2	105.7	105.7	105.7	105.7	105.7	105.7	105.7	105.7	105.7
10	104.8	105.3	105.3	105.3	105.3	105.3	105.3	105.3	105.3	105.3
8	104.4	104.9	104.9	104.9	104.9	104.9	104.9	104.9	104.9	104.9
6	104.1	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6
4	103.7	104.2	104.2	104.2	104.2	104.2	104.2	104.2	104.2	104.2
2	103.3	103.8	103.8	103.8	103.8	103.8	103.8	103.8	103.8	103.8
0	102.9	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4
-2	102.6	103.1	103.1	103.1	103.1	103.1	103.1	103.1	103.1	103.1
-4	102.2	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7
-6	101.8	102.3	102.3	102.3	102.3	102.3	102.3	102.3	102.3	102.3
-8	101.4	101.9	101.9	101.9	101.9	101.9	101.9	101.9	101.9	101.9
-10	101.0	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5
-15	100.1	100.6	100.6	100.6	100.6	100.6	100.6	100.6	100.6	100.6
-20	99.1	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6
-25	98.1	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6
-30	97.1	97.6	97.6	97.6	97.6	97.6	97.6	97.6	97.6	97.6
-35	96.1	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6
-40	95.1	95.6	95.6	95.6	95.6	95.6	95.6	95.6	95.6	95.6

CORRECTIONS:

CONFIGURATION	%N ₁ CORRECTION
Packs OFF	+ 0.3
Engine Anti-Ice ON	- 0.6 when OAT is above 10 °C

MEL SUPPORT

GO-AROUND THRUST - EEC OFF: 73-21-01

% N₁

CF6-80A2

NORMAL BLEED - PACKS ON / ANTI-ICE OFF

OAT - °C	AIRPORT PRESSURE ALTITUDE - FEET									
	-1,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
54	106.9	107.4	107.4	107.4	107.4	107.4	107.4	107.4	107.4	107.4
52	107.5	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
50	108.1	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7
48	108.6	109.2	109.2	109.2	109.2	109.2	109.2	109.2	109.2	109.2
46	109.0	109.6	109.6	109.6	109.6	109.6	109.6	109.6	109.6	109.6
44	109.5	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0
42	109.8	110.4	110.4	110.4	110.4	110.4	110.4	110.4	110.4	110.4
40	110.2	110.9	110.9	110.9	110.9	110.9	110.9	110.9	110.9	110.9
38	110.7	111.3	111.3	111.3	111.3	111.3	111.3	111.3	111.3	111.3
36	111.1	111.7	111.7	111.7	111.7	111.7	111.7	111.7	111.7	111.7
34	111.6	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2
32	111.0	111.8	112.5	112.5	112.5	112.5	112.5	112.5	112.5	112.5
30	110.6	111.4	112.2	112.9	112.9	112.9	112.9	112.9	112.9	112.9
28	110.2	111.0	111.8	112.6	113.9	113.9	113.9	113.9	113.9	113.9
26	109.9	110.7	111.4	112.2	113.5	113.5	113.5	113.5	113.5	113.5
24	109.5	110.3	111.0	111.8	113.1	114.5	114.5	114.5	114.5	114.5
22	109.1	109.9	110.7	111.4	112.7	114.0	114.4	115.6	115.6	115.6
20	108.8	109.5	110.3	111.1	112.3	113.6	114.7	115.6	116.2	116.2
18	108.4	109.2	109.9	110.7	111.9	113.2	114.3	115.2	115.7	115.7
16	108.0	108.8	109.5	110.3	111.6	112.8	113.9	114.8	115.4	115.4
14	107.6	108.4	109.2	109.9	111.2	112.5	113.5	114.4	114.9	114.9
12	107.3	108.0	108.8	109.5	110.8	112.1	113.1	114.0	114.5	114.5
10	106.9	107.7	108.4	109.1	110.4	111.7	112.7	113.6	114.1	114.1
8	106.5	107.3	108.0	108.8	110.0	111.3	112.3	113.2	113.7	113.7
6	106.1	106.9	107.6	108.4	109.6	110.9	111.9	112.8	113.3	113.3
4	105.7	106.5	107.2	108.0	109.2	110.5	111.5	112.4	112.9	112.9
2	105.4	106.1	106.8	107.6	108.8	110.1	111.1	112.0	112.5	112.5
0	105.0	105.7	106.5	107.2	108.4	109.7	110.7	111.6	112.1	112.1
-2	104.6	105.3	106.1	106.8	108.0	109.3	110.3	111.2	111.7	111.7
-4	104.2	104.9	105.7	106.4	107.6	108.9	109.9	110.7	111.3	111.3
-6	103.8	104.6	105.3	106.0	107.2	108.5	109.5	110.3	110.9	110.9
-8	103.4	104.2	104.9	105.6	106.8	108.0	109.1	109.9	110.4	110.4
-10	103.0	103.8	104.5	105.2	106.4	107.6	108.7	109.5	110.0	110.0
-15	102.0	102.8	103.5	104.2	105.4	106.6	107.6	108.5	109.0	109.0
-20	101.0	101.8	102.5	103.2	104.4	105.6	106.6	107.4	107.9	107.9
-25	100.0	100.8	101.5	102.2	103.3	104.5	105.5	106.3	106.8	106.8
-30	99.0	99.7	100.4	101.1	102.3	103.5	104.4	105.2	105.8	105.8
-35	98.0	98.7	99.4	100.1	101.2	102.4	103.4	104.2	104.7	104.7
-40	97.0	97.7	98.3	99.0	100.1	101.3	102.3	103.1	103.5	103.5

CORRECTIONS:

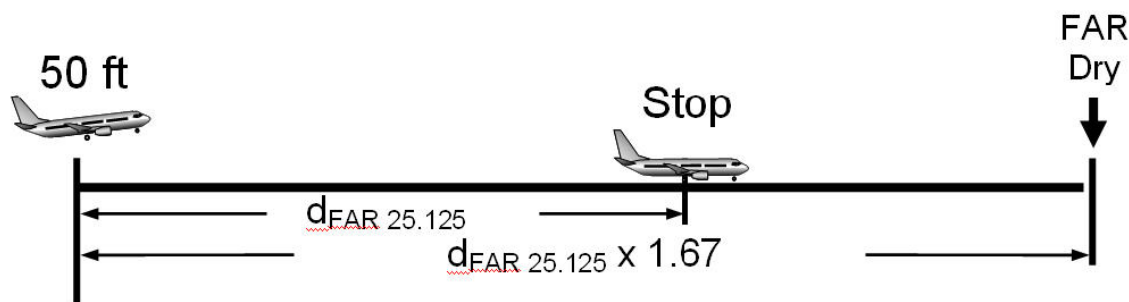
CONFIGURATION	%N ₁ CORRECTION
Packs OFF	+ 0.3
Engine Anti-Ice ON	- 0.6 when OAT is above 10 °C
Wing Anti-Ice ON	0.0
Engine inoperative and Wing Anti-Ice ON	- 0.3

MEL SUPPORT

FAR LANDING DISTANCES (FACTORED)

DEFINITION

All given distances in this section are FAR (Factored) Landing Distances. These distances represent the actual (or demonstrated) landing distances – designated as d_{FAR} in the diagram below – multiplied by a factor of 1.67.



FAR Landing Distance Diagram

This is in accordance with FAR 121.195, requiring the aircraft to be able to come to a complete stop within 60% of the effective length of the runway.

APPLICABILITY

The tables on the following pages provide landing distances and approach speeds to be used for dispatch with the given conditions and the associated MEL applied. For landing distances in the event of an in-flight system failure or abnormality not detected at or prior to dispatch, please refer to the "Abnormal Configuration Actual Landing Distances and Approach Speeds" pages in this section of the ODM.

ASSUMPTIONS

The data within this section was generated based on a set of assumed conditions:

- Standard day conditions
- No wind
- No slope
- No reverse thrust credit factored in FAR Landing Distances
- Maximum manual braking
- Includes distance from 50 feet above threshold to stop (1,000 feet of air distance)

MEL SUPPORT

FAR LANDING DISTANCES (FACTORED)

ANTI-SKID INOP – DRY RUNWAY

FLAPS 30

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
350,000									
340,000									
330,000									
320,000									
310,000									
300,000	10,590								
290,000	10,280	10,500							
280,000	9,990	10,220	10,460	10,730					
270,000	9,680	9,920	10,160	10,400	10,660				
260,000	9,390	9,620	9,860	10,100	10,350	10,620			
250,000	9,100	9,320	9,550	9,800	10,050	10,290	10,540	10,810	
240,000	8,820	9,030	9,250	9,500	9,740	9,970	10,200	10,470	10,760
230,000	8,530	8,730	8,950	9,180	9,420	9,640	9,870	10,130	10,410
220,000	8,240	8,430	8,640	8,870	9,110	9,320	9,530	9,790	10,070
210,000	7,960	8,140	8,330	8,560	8,790	8,980	9,180	9,430	9,710
200,000	7,690	7,840	8,020	8,250	8,470	8,650	8,840	9,070	9,340

ANTI-SKID INOP - WET RUNWAY

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
350,000									
340,000									
330,000									
320,000									
310,000									
300,000	12,180								
290,000	11,830	12,080							
280,000	11,480	11,750	12,030	12,340					
270,000	11,130	11,400	11,680	11,960	12,260				
260,000	10,790	11,060	11,330	11,610	11,900	12,210			
250,000	10,470	10,720	10,980	11,260	11,550	11,830	12,120	12,430	
240,000	10,140	10,380	10,640	10,920	11,200	11,460	11,730	12,040	12,370
230,000	9,810	10,040	10,290	10,560	10,840	11,090	11,350	11,650	11,970
220,000	9,480	9,700	9,940	10,200	10,470	10,710	10,960	11,260	11,580
210,000	9,150	9,360	9,580	9,840	10,110	10,330	10,560	10,840	11,170
200,000	8,840	9,020	9,230	9,480	9,740	9,950	10,160	10,430	10,740

CORRECTIONS:

Headwind per kt	- 40 ft
Tailwind per kt	+ 180 ft

MEL SUPPORT

FAR LANDING DISTANCES (FACTORED)

ONE BRAKE DEACTIVATED – DRY RUNWAY

FLAPS 30

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
350,000	7,580	7,760	7,950	8,150	8,360	8,580	8,810	9,040	9,280
340,000	7,190	7,360	7,540	7,720	7,920	8,120	8,320	8,540	8,770
330,000	6,850	7,000	7,170	7,340	7,510	7,690	7,880	8,080	8,290
320,000	6,530	6,680	6,840	6,990	7,150	7,320	7,490	7,670	7,860
310,000	6,240	6,390	6,540	6,690	6,840	6,990	7,140	7,310	7,480
300,000	6,030	6,160	6,290	6,430	6,580	6,730	6,870	7,030	7,200
290,000	5,870	6,000	6,130	6,270	6,410	6,540	6,680	6,840	7,000
280,000	5,720	5,840	5,970	6,110	6,240	6,370	6,510	6,660	6,820
270,000	5,560	5,690	5,810	5,940	6,070	6,200	6,330	6,480	6,630
260,000	5,410	5,540	5,660	5,780	5,910	6,030	6,160	6,300	6,450
250,000	5,260	5,390	5,510	5,620	5,740	5,860	5,990	6,120	6,270
240,000	5,110	5,230	5,350	5,460	5,570	5,690	5,810	5,940	6,080
230,000	4,960	5,080	5,190	5,290	5,400	5,510	5,630	5,760	5,900
220,000	4,810	4,920	5,030	5,130	5,230	5,340	5,450	5,580	5,710
210,000	4,650	4,760	4,860	4,960	5,060	5,160	5,280	5,400	5,530
200,000	4,600	4,650	4,700	4,800	4,890	5,000	5,100	5,220	5,340

ONE BRAKE DEACTIVATED - WET RUNWAY

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
350,000	8,620	8,830	9,050	9,280	9,530	9,780	10,040	10,300	10,580
340,000	8,180	8,370	8,580	8,790	9,020	9,240	9,480	9,730	10,000
330,000	7,780	7,960	8,150	8,350	8,550	8,750	8,970	9,200	9,450
320,000	7,420	7,590	7,770	7,950	8,140	8,330	8,530	8,730	8,950
310,000	7,090	7,260	7,430	7,600	7,780	7,950	8,120	8,310	8,510
300,000	6,840	6,990	7,140	7,310	7,480	7,640	7,810	8,000	8,190
290,000	6,660	6,810	6,960	7,120	7,280	7,440	7,600	7,770	7,960
280,000	6,480	6,630	6,780	6,930	7,090	7,240	7,390	7,560	7,750
270,000	6,310	6,450	6,600	6,740	6,890	7,040	7,190	7,360	7,540
260,000	6,140	6,280	6,420	6,560	6,700	6,840	6,990	7,160	7,330
250,000	5,960	6,100	6,240	6,370	6,510	6,650	6,790	6,950	7,120
240,000	5,790	5,930	6,060	6,190	6,310	6,450	6,590	6,740	6,900
230,000	5,620	5,750	5,880	6,000	6,120	6,250	6,380	6,530	6,690
220,000	5,440	5,570	5,690	5,800	5,920	6,050	6,180	6,320	6,480
210,000	5,260	5,380	5,500	5,610	5,730	5,850	5,980	6,120	6,260
200,000	5,200	5,260	5,320	5,430	5,540	5,660	5,780	5,920	6,060

CORRECTIONS:

Headwind per kt	- 30 ft
Tailwind per kt	+ 180 ft

MEL SUPPORT

FAR LANDING DISTANCES (FACTORED)

AUTO SPOILERS INOP – DRY RUNWAY
FLAPS 30

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
350,000	7,680	7,860	8,050	8,250	8,460	8,680	8,910	9,140	9,380
340,000	7,290	7,460	7,640	7,820	8,020	8,220	8,420	8,640	8,870
330,000	6,950	7,100	7,270	7,440	7,610	7,790	7,980	8,180	8,390
320,000	6,630	6,780	6,940	7,090	7,250	7,420	7,590	7,770	7,960
310,000	6,340	6,490	6,640	6,790	6,940	7,090	7,240	7,410	7,580
300,000	6,130	6,260	6,390	6,530	6,680	6,830	6,970	7,130	7,300
290,000	5,970	6,100	6,230	6,370	6,510	6,640	6,780	6,940	7,100
280,000	5,820	5,940	6,070	6,210	6,340	6,470	6,610	6,760	6,920
270,000	5,660	5,790	5,910	6,040	6,170	6,300	6,430	6,580	6,730
260,000	5,510	5,640	5,760	5,880	6,010	6,130	6,260	6,400	6,550
250,000	5,360	5,490	5,610	5,720	5,840	5,960	6,090	6,220	6,370
240,000	5,210	5,330	5,450	5,560	5,670	5,790	5,910	6,040	6,180
230,000	5,060	5,180	5,290	5,390	5,500	5,610	5,730	5,860	6,000
220,000	4,910	5,020	5,130	5,230	5,330	5,440	5,550	5,680	5,810
210,000	4,750	4,860	4,960	5,060	5,160	5,260	5,380	5,500	5,630
200,000	4,700	4,750	4,800	4,900	4,990	5,100	5,200	5,320	5,440

AUTO SPOILERS INOP - WET RUNWAY

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
350,000	8,720	8,930	9,150	9,380	9,630	9,880	10,140	10,400	10,680
340,000	8,280	8,470	8,680	8,890	9,120	9,340	9,580	9,830	10,100
330,000	7,880	8,060	8,250	8,450	8,650	8,850	9,070	9,300	9,550
320,000	7,520	7,690	7,870	8,050	8,240	8,430	8,630	8,830	9,050
310,000	7,190	7,360	7,530	7,700	7,880	8,050	8,220	8,410	8,610
300,000	6,940	7,090	7,240	7,410	7,580	7,740	7,910	8,100	8,290
290,000	6,760	6,910	7,060	7,220	7,380	7,540	7,700	7,870	8,060
280,000	6,580	6,730	6,880	7,030	7,190	7,340	7,490	7,660	7,850
270,000	6,410	6,550	6,700	6,840	6,990	7,140	7,290	7,460	7,640
260,000	6,240	6,380	6,520	6,660	6,800	6,940	7,090	7,260	7,430
250,000	6,060	6,200	6,340	6,470	6,610	6,750	6,890	7,050	7,220
240,000	5,890	6,030	6,160	6,290	6,410	6,550	6,690	6,840	7,000
230,000	5,720	5,850	5,980	6,100	6,220	6,350	6,480	6,630	6,790
220,000	5,540	5,670	5,790	5,900	6,020	6,150	6,280	6,420	6,580
210,000	5,360	5,480	5,600	5,710	5,830	5,950	6,080	6,220	6,360
200,000	5,300	5,360	5,420	5,530	5,640	5,760	5,880	6,020	6,160

CORRECTIONS:

Headwind per kt	- 30 ft
Tailwind per kt	+ 180 ft

End of Section

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AUTHORIZATION AND FLIGHT PLANNING

Authorization, procedures, and applicability of data for ferry operations are described the Flight Operations Manual (Chapters 9 and 35) and the Technical Operations Policies and Procedures Manual (TOPP chapter 40-60-05). Procedures outlined in those manuals must be strictly adhered to.

Ferry operational data is available for the following configuration:

- Flaps Retracted (Slats Extended for Takeoff and Landing)
- Landing Gear Extended

The following method should be used for ferry flight planning and certain revenue flight planning (as noted) and operations:

1. Obtain a normal aircraft configuration (computerized or manual) unfilled flight plan using Long Range Cruise (LRC) at the proposed cruise altitude. (The following FERRY pages contain recommended cruise altitude under the Flight Planning heading.)

NOTE: If a computerized flight plan is available for the aircraft configuration, the computerized flight plan should be used in lieu of FERRY data. Data contained in this section is conservative compared to the optimized data contained in the computerized flight plan.

2. Calculate the trip time and fuel load based on the values in the flight plan by multiplying the time and fuel values obtained in Step 1 by the factors listed under the appropriate ferry configuration. Enter this data either in the Dispatcher Remarks section of the Computerized Flight Plan.
3. Add remarks containing the ferry speed, speed limit, altitude limit, total time, leg times if appropriate, and engine-out altitude capability.

Note: Suggested cruise altitudes are for reference, and reasonable adjustments may be made to accommodate ATC and direction of flight.

4. Assure adequate terrain clearance by referring to the One Engine Inoperative Altitude Capability table, if applicable (see ferry configuration page, Enroute heading).
5. Adjust the a) Runway Allowable Weight
b) Climb Limit Takeoff Weight
c) Landing Climb Limit Weight
as follows:

From the appropriate ferry configuration page, subtract the weight decrements indicated under the Takeoff and Landing headings, from the NORMAL Thrust takeoff weights and the Landing Climb weight, respectively, obtained from the ARM (Airport Section).

The following limitations should be applied to all ferry flights:

1. All ferry flight takeoffs will be done at full (TO) thrust (TMC TO) and climb out will be made at Maximum Climb thrust (TMC CLB).
2. Observe additional limitations and restrictions as listed for each ferry configuration on the following data pages.

FLAPS RETRACTED (SLATS EXTENDED)

Use the following conditions and factors for flaps retracted ferry operations:

LIMITATIONS

Maximum Cruise Altitude:	Normal.
Maximum Speed:	Normal.
C. G. Limitations:	No additional restrictions.
En Route Weather Restrictions:	No additional restrictions.

FLIGHT PLANNING

Flight Plan as Normal.

Target Gate Arrival Fuel: 11,500 lbs. plus fuel to Alternate.

TAKEOFF

Select **FLAPS 1 for Takeoff** (Slats Extended/Flaps Retracted) and use the following adjustments to Runway Allowable Limit Takeoff Weights:

Packs ON or OFF, From Flaps 5 data, Subtract 27,000 lbs

Packs ON or OFF, From Flaps 15 data, Subtract 42,000 lbs.

Takeoff V Speeds:

Weight LBS	Field Elev. FT	V1		VR		V2	
		Ambient Temperature - Degree C					
		20 & Below	40	20 & Below	40	20 & Below	40
320,000	SL	168	169	171	172	175	175
	8,000	171	173	173	176	176	177
280,000	SL	154	156	158	159	164	164
	8,000	157	160	161	163	164	165
240,000	SL	139	140	144	145	152	152
	8,000	143	144	147	149	152	152
200,000	SL	121	123	128	129	139	139
	8,000	124	128	132	134	139	139

Thrust Setting Restrictions:	<u>NORMAL only</u> , ALTERNATE Thrust <u>NOT</u> approved.
Flap/Slat Setting Restrictions:	Select Flaps 1 (Slats Extended/Flaps Retracted).
Safe pitch attitude with engine failure:	Normal
*Stabilizer Setting:	Normal
Operation from Contaminated Runway:	<u>NOT</u> permitted.

***NOTE:** Since the electrical trim limit is reduced when the airplane is in the Flaps Up configuration, it may be necessary to use the alternate trim system to set the stabilizer to the value specified in the manuals.

ENROUTE

Climb:	Use <u>MAXIMUM</u> Climb Thrust (TMC CLB)/ODM.
Cruise:	Cruise Limits per FMS(TMC CRZ)/ODM.
Additional Information:	Use normal climb, cruise, and descent speeds and thrusts (TMC/ODM).

LANDING

Landing Speed Restrictions:	Flaps 0 / Slats Extended Speed per ODM ABNORMAL Section
Flap/Slat Setting Restrictions:	Flaps 0 / Slats Extended.
Minimum Runway Length:	See ABNORMAL Section for ACTUAL landing distances.
Adjustment to Landing Climb Limit Weights:	None.

HOLDING

Standard FMS/ODM speeds and thrusts.

LANDING GEAR EXTENDED

LIMITATIONS:

Refer to "Landing Gear Extended Revenue Operations" in the Abnormal section of the ODM for a list of operational limitations.

FLIGHT PLANNING

Fuel Required / Trip Time (1,000 lb / hours):

PRESSURE ALTITUDE - FEET	RANGE – NAUTICAL GROUND MILES			
	300	600	900	1,200
8,000	25.0 / 1.75	50.0 / 3.30	76.5 / 4.85	103.5 / 6.30
12,000	23.5 / 1.68	47.0 / 3.20	71.0 / 4.65	96.5 / 6.05
16,000	22.5 / 1.60	44.0 / 3.05	66.5 / 4.45	90.5 / 5.80
20,000	21.0 / 1.55	41.5 / 2.93	63.0 / 4.25	86.5 / 5.60
24,000 and Above	20.0 / 1.48	39.5 / 2.80	60.0 / 4.10	

NOTE: Based on Long Range Cruise, VREF30 + 70 climb/descent, standard day conditions, zero winds.

TAKEOFF

RATOW & Takeoff climb limit weight:

Use GRD TPI in AWABS

Takeoff V Speeds:

Use GRD TPI in AWABS

Takeoff Thrust Settings:

Use NORMAL only, ALTERNATE thrust NOT approved.

Takeoff Flap Settings:

Flaps 5 only.

Operation from Contaminated Runway:

Use GRD TPI. Wet runways only, NOT permitted on Icy or Cluttered Runways.

LANDING GEAR EXTENDED (cont.)

ENROUTE

Long Range Cruise Table

GROSS WEIGHT - POUNDS	PRESSURE ALTITUDE - 1,000 FEET							
	CRUISE SPEED - KIAS							
	%N1							
	FUEL FLOW / ENGINE - LB/HR							
	6	10	14	18	22	26	30	34
420,000	262 93.1 11153	261 96.3 11085						
400,000	257 91.7 10644	255 94.8 10521						
380,000	252 90.3 10129	249 93.3 9971	248 96.8 9953					
360,000	247 88.8 9619	244 91.8 9449	242 95.1 9388	240 98.6 9378				
340,000	241 87.4 9105	238 90.2 8946	236 93.4 8835	235 96.9 8825				
320,000	235 85.7 8600	232 88.6 8440	229 91.6 8296	228 95.1 8273	225 98.9 8251			
300,000	227 83.7 8067	226 86.9 7935	223 89.8 7789	222 93.1 7719	220 96.8 7705	217 101.7 7870		
280,000	220 81.6 7519	220 85.2 7431	217 88.0 7293	215 91.1 7180	214 94.7 7164	210 98.8 7161		
260,000	212 79.6 7012	212 82.9 6913	211 86.1 6795	208 89.1 6666	207 92.5 6620	205 96.2 6605	202 102.3 6839	
240,000	205 77.6 6536	204 80.5 6372	204 84.1 6296	201 86.9 6177	199 90.1 6083	198 93.8 6070	196 98.4 6159	
220,000	198 75.3 6123	196 78.2 5875	196 81.5 5783	194 84.7 5684	192 87.8 5572	191 91.4 5550	191 95.7 5631	191 103.7 6012

Refer to "Landing Gear Extended Revenue Operations" in the Abnormal section of the ODM for driftdown performance and Long Range Cruise speeds, N1 settings, and altitude capability.

LANDING

Landing Speed restrictions:

No additional restrictions

Flap Setting Restrictions:

No additional restrictions

Approach & Landing climb limit weights:

Use GRD LPI data if available, otherwise reduce standard landing climb limit by 98,000 lbs

LANDING GEAR EXTENDED (cont.)HOLDING SPEED / THRUST (KIAS / %N1)

WEIGHT - POUNDS	ALTITUDE - FEET	
	10,000	15,000
420,000	251 / 95.1	
400,000	244 / 93.4	
380,000	237 / 91.8	237 / 96.3
360,000	230 / 90.1	230 / 94.5
340,000	223 / 88.3	223 / 92.6
320,000	216 / 86.4	216 / 90.7
300,000	211 / 84.8	211 / 89.0
280,000	206 / 82.9	206 / 87.2
260,000	201 / 81.1	201 / 85.4
240,000	196 / 79.2	196 / 83.6
220,000	191 / 77.4	191 / 81.6

End of Section